IMP 7 (EXPLORER 47) TRAJECTORY
SEPTEMBER 26, 1972 TO SEPTEMBER 25, 1978

bу

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Alan J. Lazarus

CSR-TR-88-3

April 21, 1988

This report contains trajectory plots for IMP-7 (Explorer 47). For each orbit the trajectory is shown in five panels on two pages; each panel is a different representation or projection. The trajectory parameters were obtained from the multi-coordinate ephemeris (MCE) tapes supplied to IMP experimenters by the IMP project.

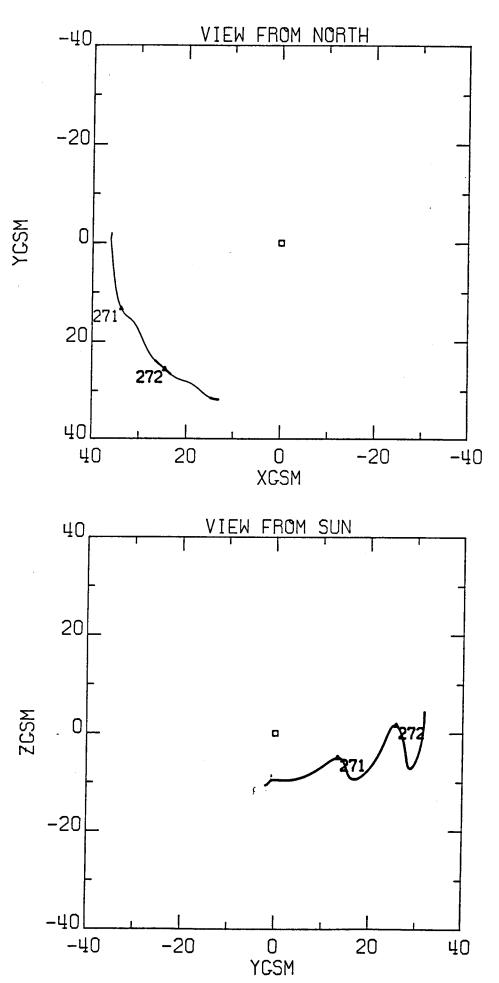
The plots on the right hand pages use a geocentric, solar-ecliptic coordinate system (the XSE-axis points towards the Sun; the YSE-axis is in the ecliptic plane oppositely directed to the motion of the earth in its orbit; and the ZSE-axis completes the right-handed coordinate system). Distances are in units of Earth radii (6371 km). The upper panel shows the trajectory in cylindrical coordinates. The Sun-Earth line is the axis of the cylinder and one would expect the earth's bow shock and magnetopause to be roughly symmetric about that axis (neglecting aberration of the flow). Average shock and magnetopause shapes are shown on the plot to give a sense of the region which the spacecraft is traversing. The moon's position is also shown in the upper panel of most of the plots; the orbit of the moon clearly is badly distorted on the remaining plots due to bad data on the MCE tapes. Note that the node number may also be incorrect.

The plots on the left-hand pages use geocentric, solar magnetospheric coordinates with distances in Earth radii (the XGSM-axis points at the sun; the XGSM-ZGSM plane contains the geomagnetic dipole such that ZGSM is positive northward; and the YGSM-axis completes the right-handed coordinate system). Two different weight lines are used; the lighter line corresponds to negative values of ZGSM in the upper panel and to values of XGSM less than -10 in the lower panel.

Time is indicated by a symbol at the beginning of each day; normally the day number for every second day is given. Similar plots of the trajectory have been distributed by King and Teague.  $^2$ 

Model shock and magnetopause are taken from, "Explorer 33 and 35 Plasma observations of Magnetosheath Flow," H. C. Howe, Jr., and J. H. Binsack, JGR 77, 3334 (1972), Equations 1 and 2.

<sup>&</sup>lt;sup>2</sup>J. H. King and M. J. Teague, Trajectories of Explorer 43, 47 and 50, September 1972-December 1975, GSFC-X-601-76-38.



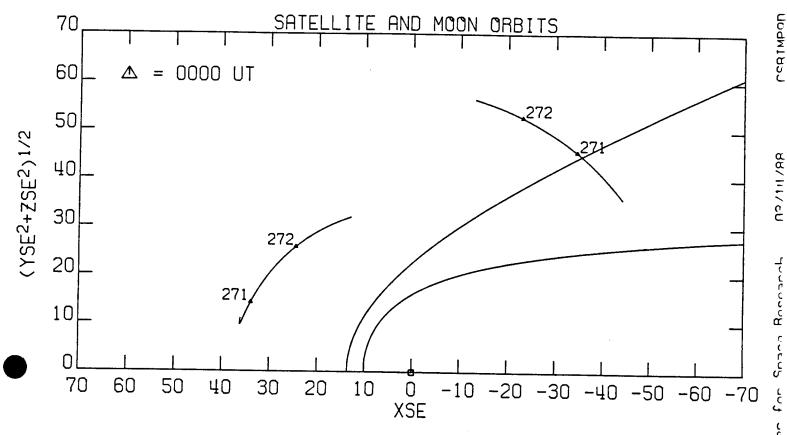
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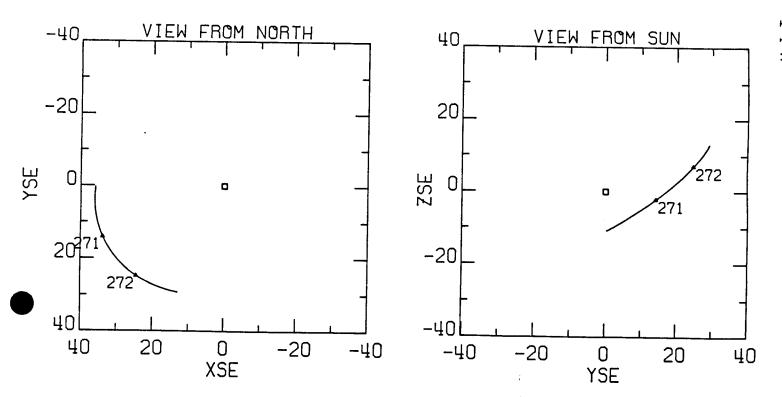
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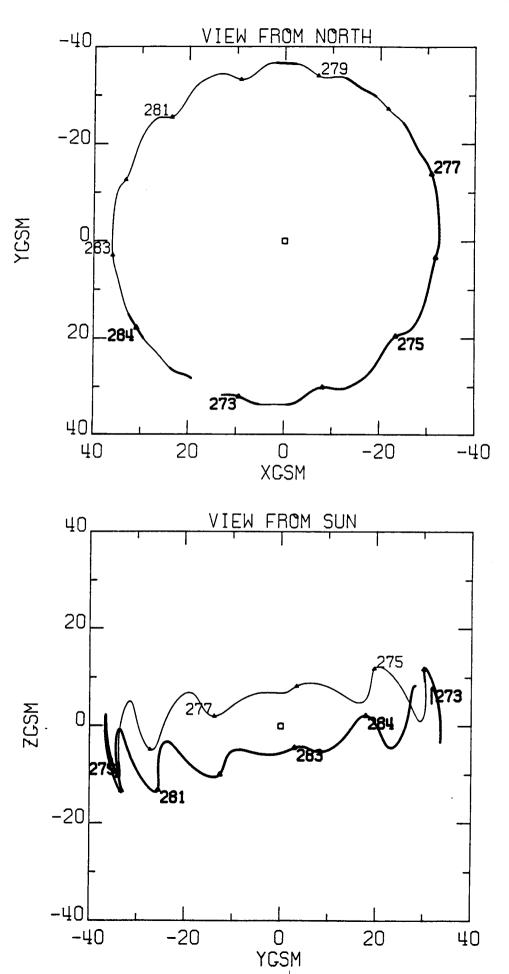
IMP 7 TRAJECTORY. ASCENDING NODE O

FROM SEP 26 TO SEP 28 1972 DAYS 270 THRU 272

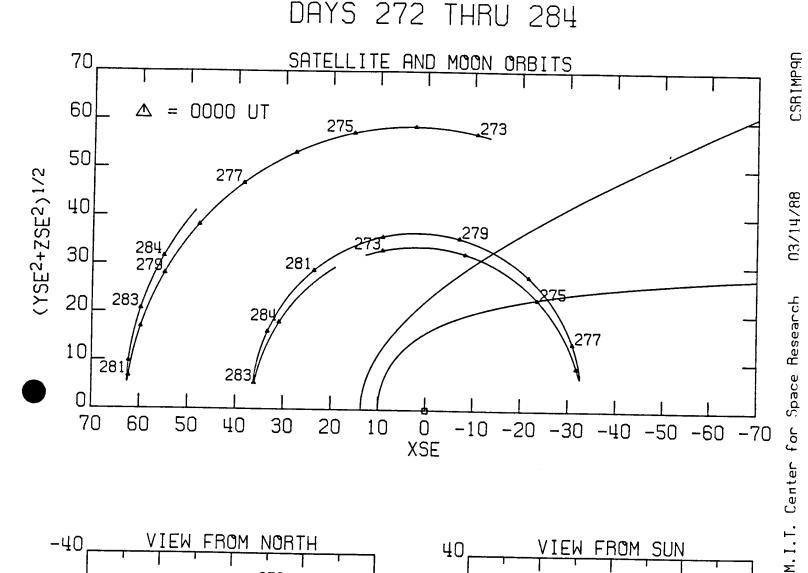


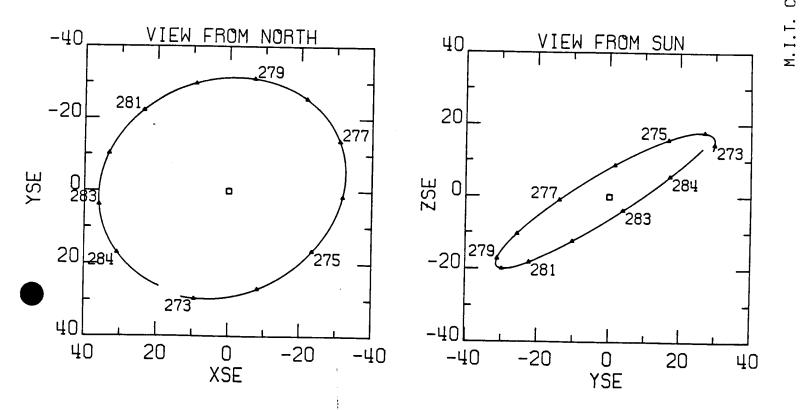


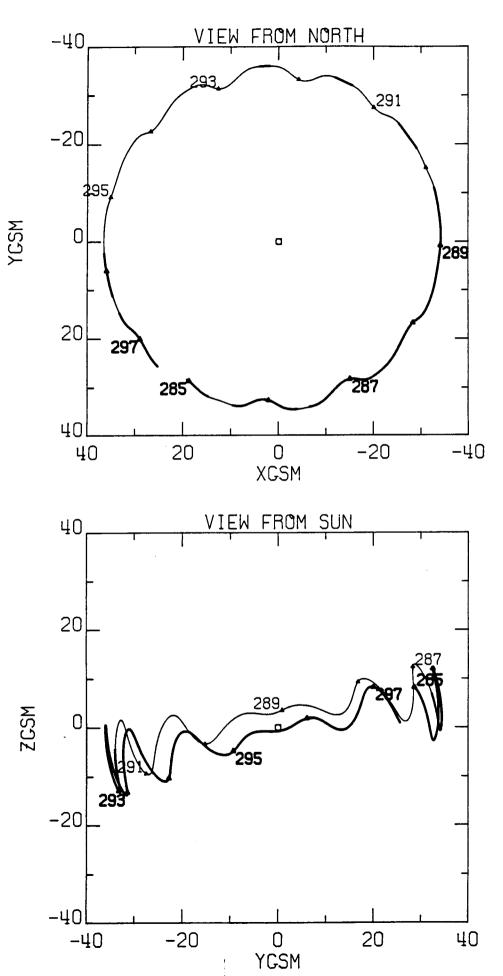
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IMP 7 TRAJECTORY. ASCENDING NODE 1
FROM SEP 28 TO OCT 10 1972
DAYS 272 THRU 284







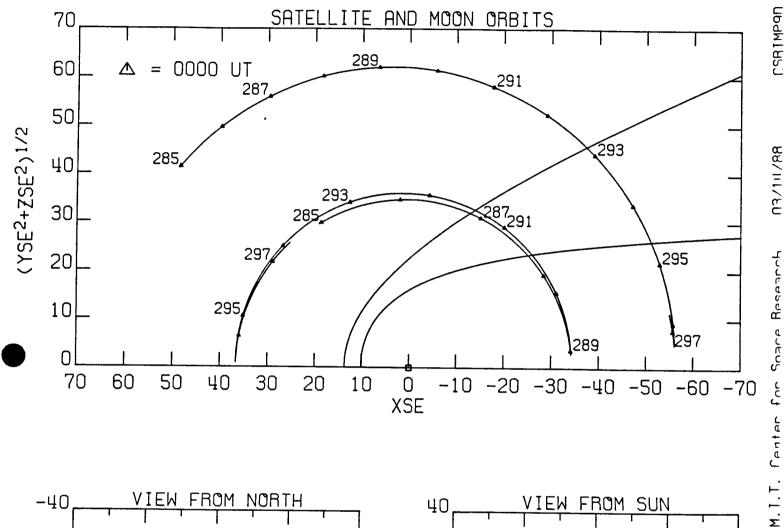
M.I.T. Center for Space Research 03/14/88

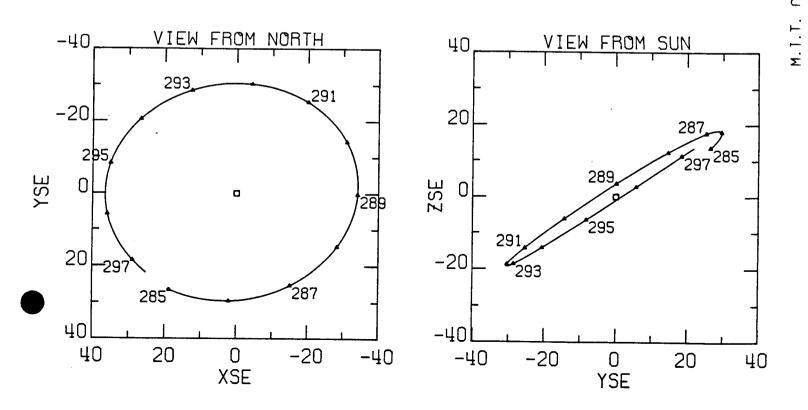
IMP 7 TRAJECTORY. ASCENDING NODE 2

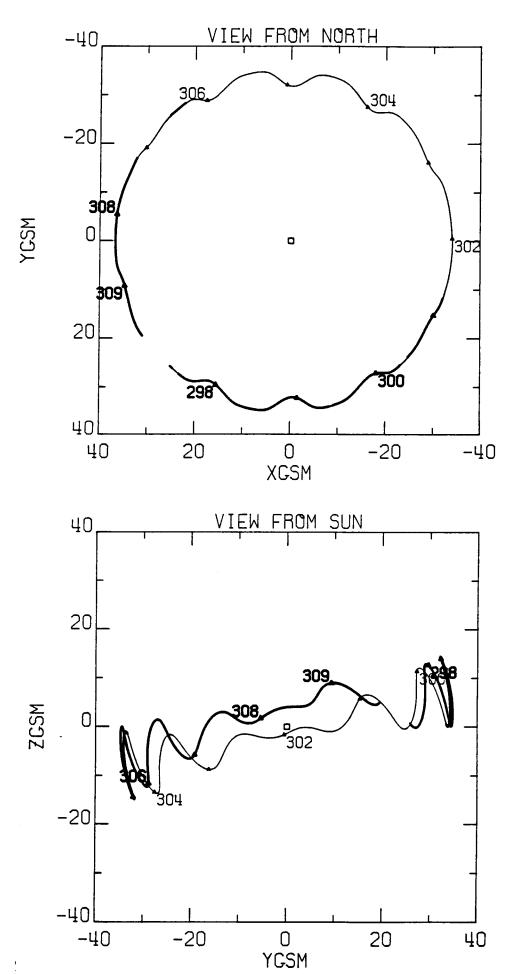
FROM OCT 10 TO OCT 23 1972

DAYS 284 THRU 297

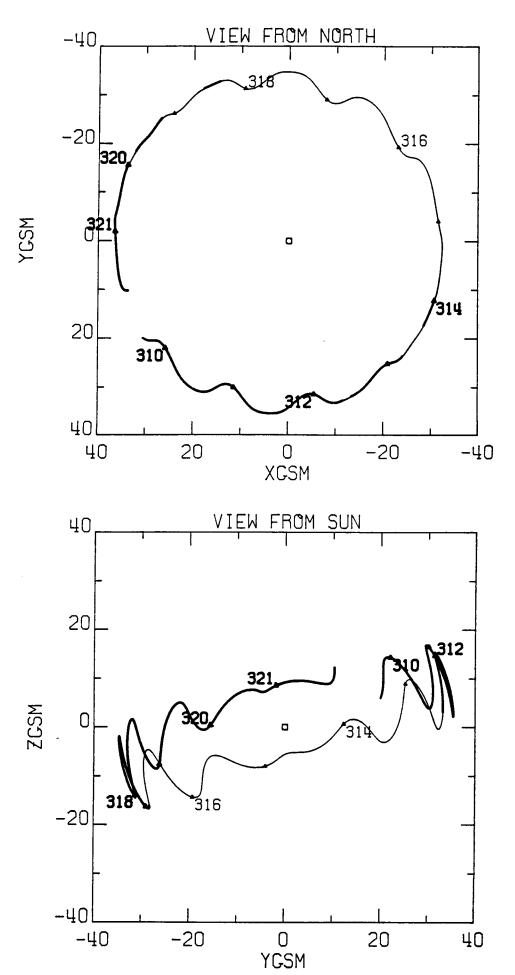
SATELLITE AND MOON ORBITS



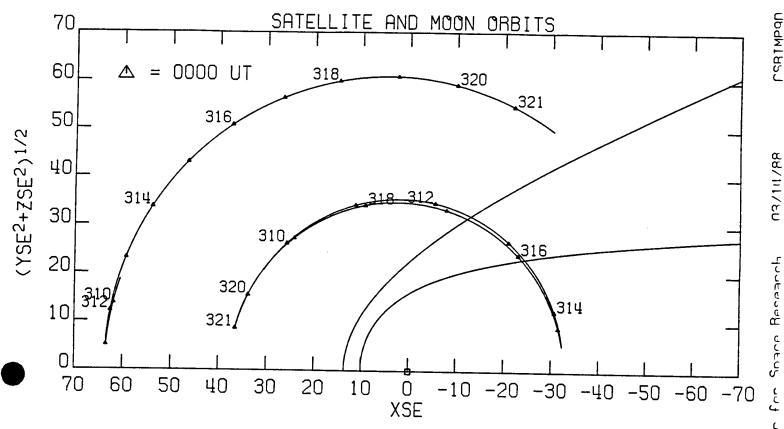


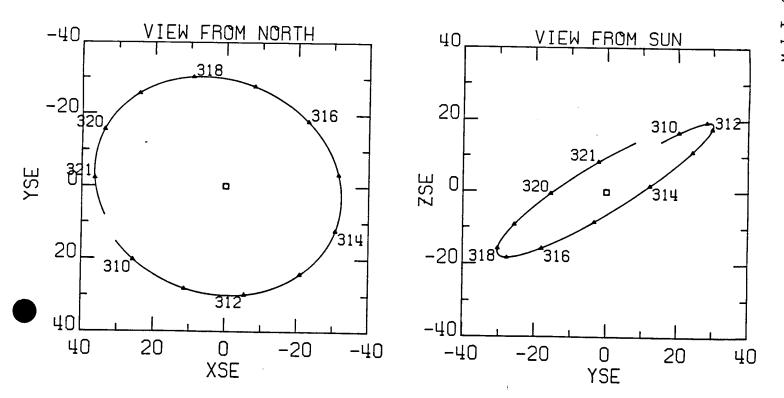


IMP TRAJECTORY. ASCENDING NODE 3 FROM OCT 23 TO NOV DAYS 297 THRU SATELLITE AND MOON ORBITS CSR I MP9D 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 03/14/88 M.I.T. Center for Space Research XSE -30 -40 -10 -20 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 YSE ZSE -20 O XSE -20 -40 O YSE -40 -20 

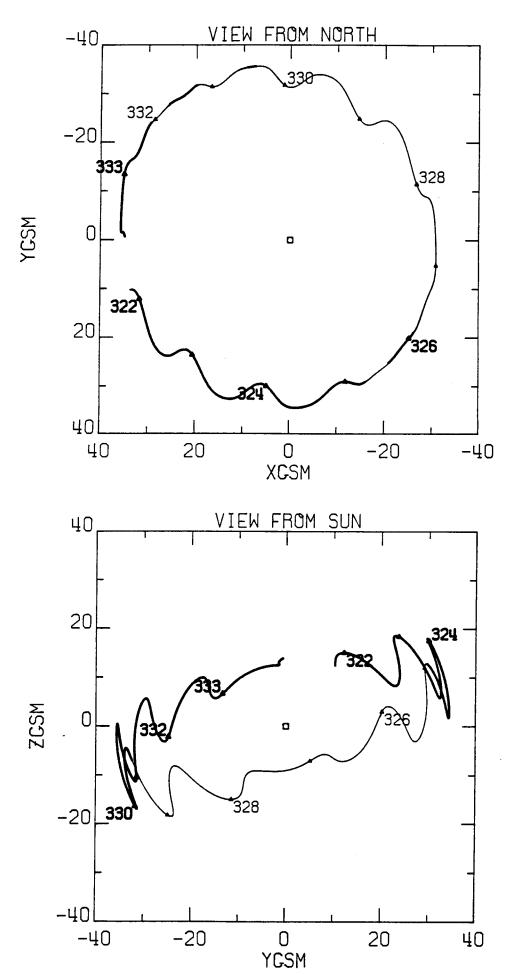


7 TRAJECTORY. ASCENDING NODE 4 FROM NOV 4 TO NOV 16 1972 DAYS 309 THRU 321

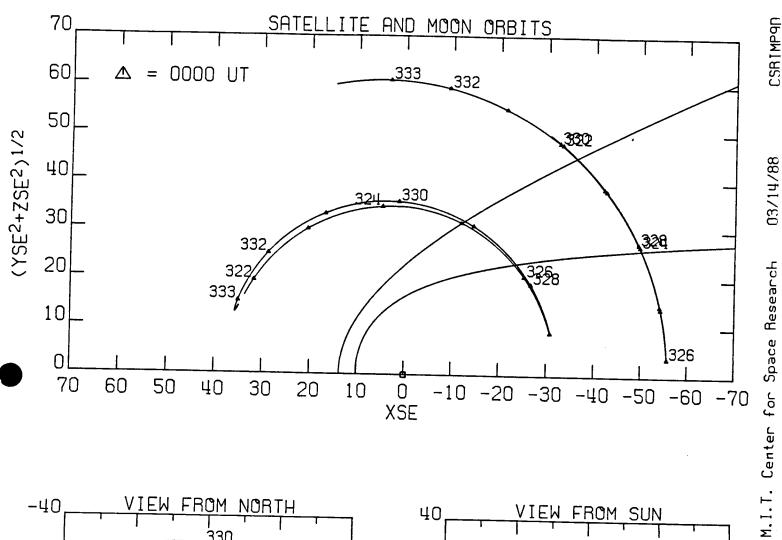


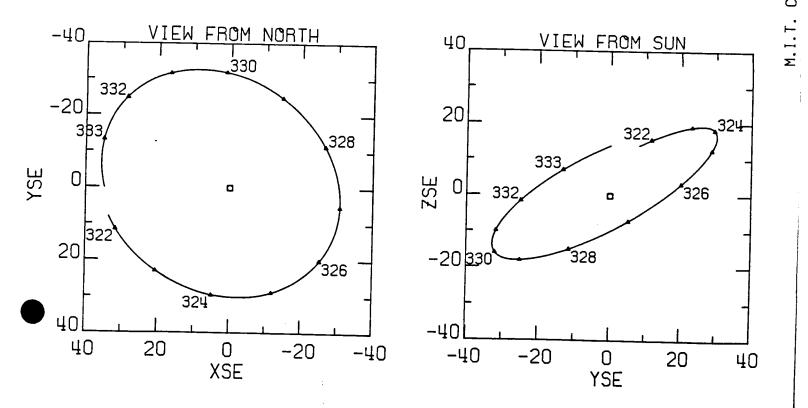


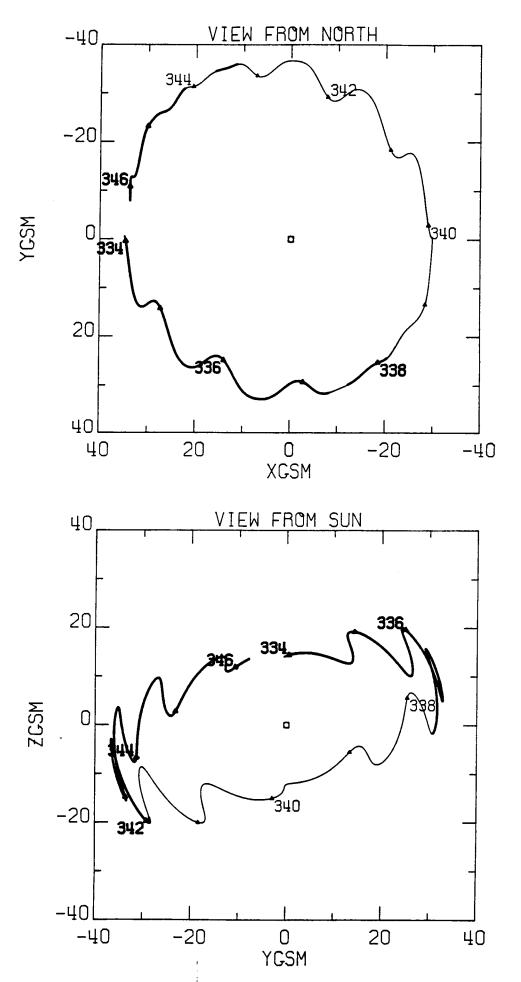
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IMP 7 TRAJECTORY. ASCENDING NODE 5
FROM NOV 16 TO NOV 28 1972
DAYS 321 THRU 333







IMP 7 TRAJECTORY. ASCENDING NODE 6 FROM NOV 28 TO DEC 1972 11 DAYS 333 THRU 346 CSRIMP9D ITE AND MOON ORBITS 70 0000 UT 60 334 338346 50 03/14/88 40 34 338 342 344,236 30 M.I.T. Center for Space Research 20 10 340 10 340 **(**340 0 30 Ö XSE 70 60 50 40 20 10 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 344 342 -20 20 336 346\_334 ZSE 340 0 0 **338** 0 0 344 334 20 340 -201342338 336 40

(YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup>

YSE

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XŠE

-20

-40

-20

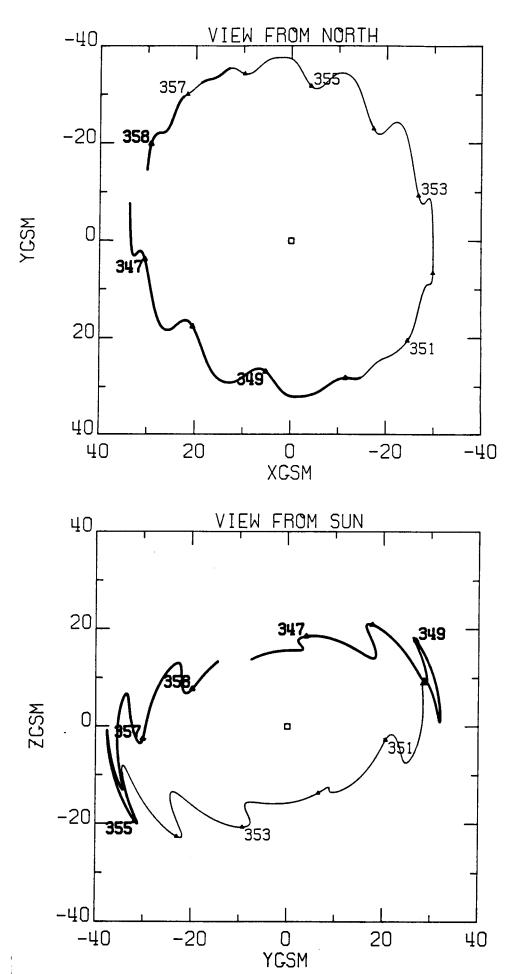
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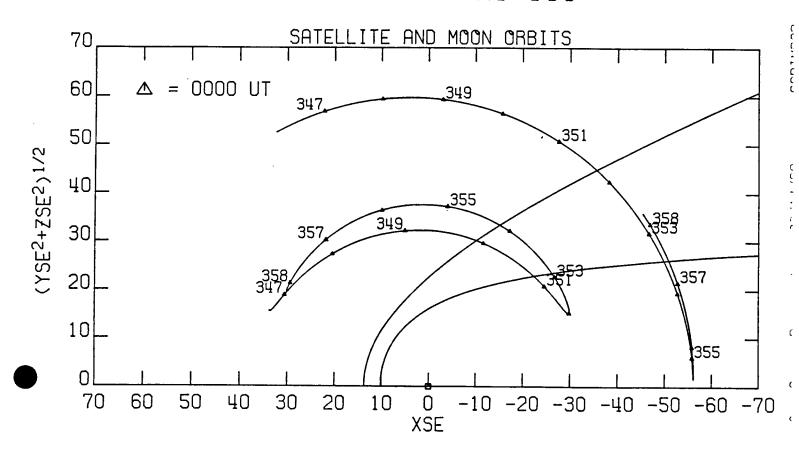
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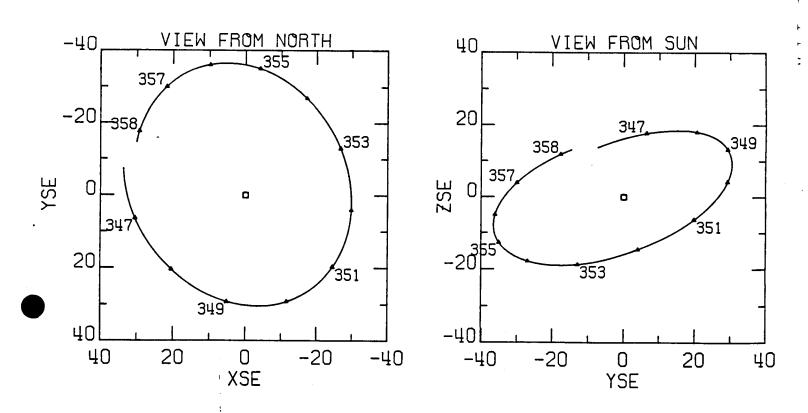
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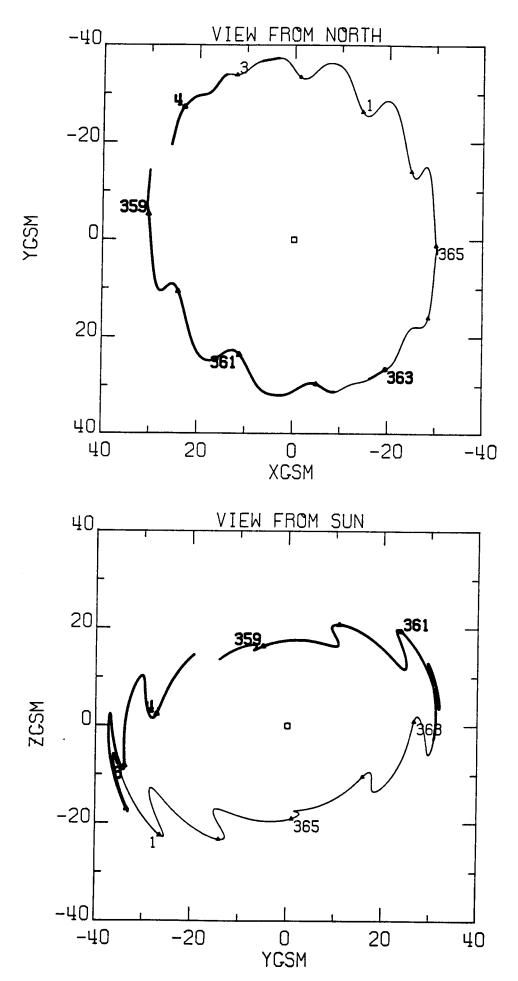


IMP 7 TRAJECTORY. ASCENDING NODE 7

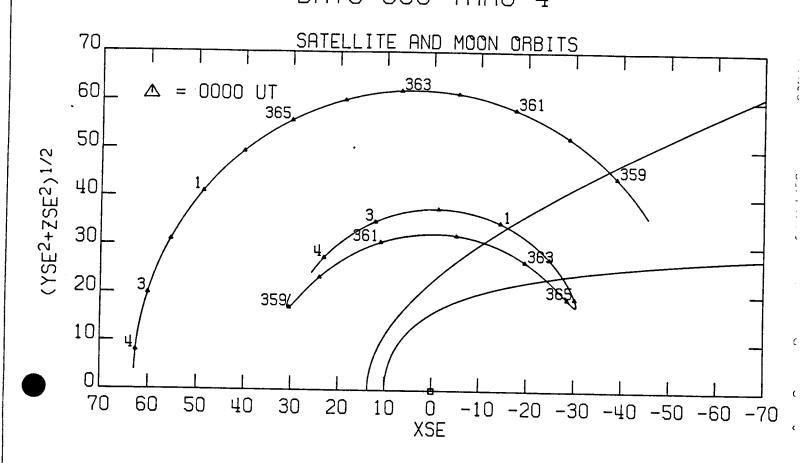
## FROM DEC 11 TO DEC 23 1972 DAYS 346 THRU 358

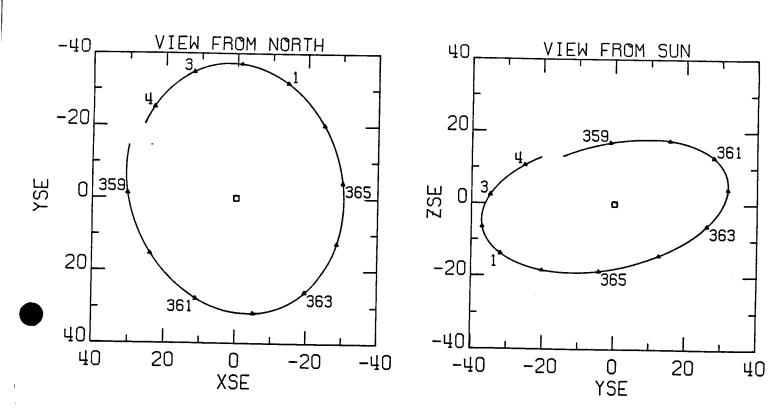


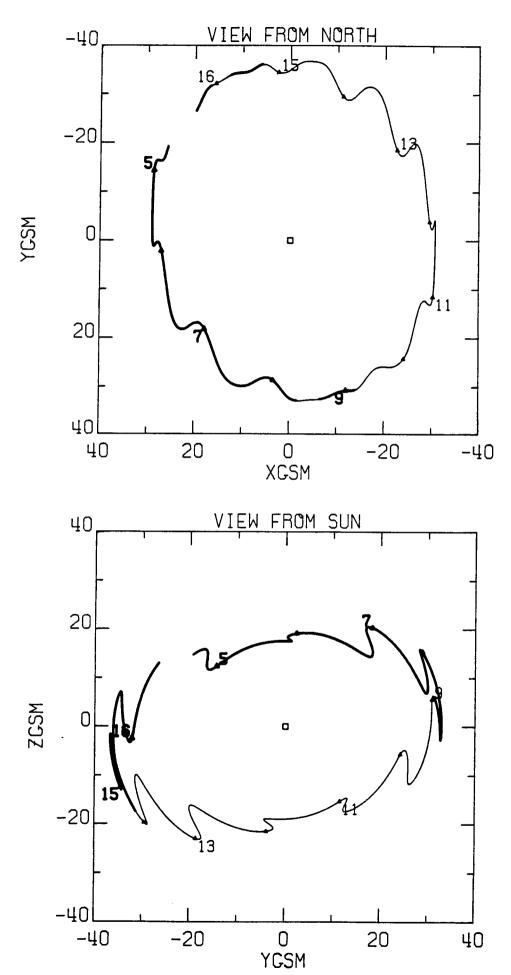




IMP 7 TRAJECTORY. ASCENDING NODE 8
FROM DEC 23 TO JAN 4 1973
DAYS 358 THRU 4







IMP 7 TRAJECTORY. ASCENDING NODE 9 FROM JAN 4 NAL OT 16 1973 DAYS 4 THRU 16 70 CCRIMDON AND MOON ORBITS 60 0000 UT 13 50 A2/111/50 40 15 16 30 13 20 Fonton for Space Recornel 10 70 50 60 Ö XSE 40 30 20 10 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 40 16 13 -20 20 16 0 , ZSE ٥ ٥ 11 20 -2013 11 40

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(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2

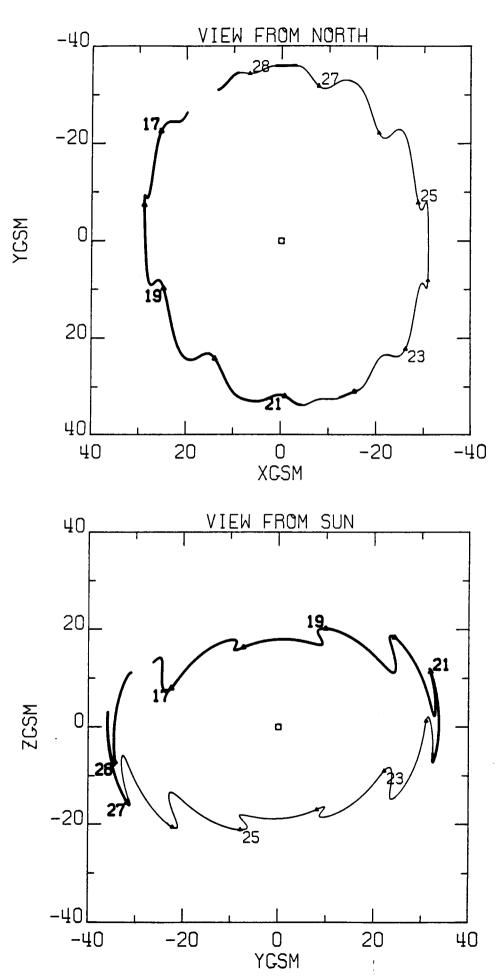
YSE

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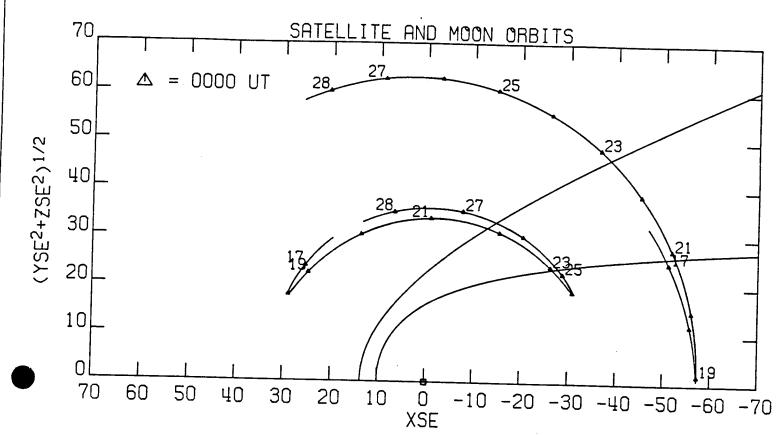
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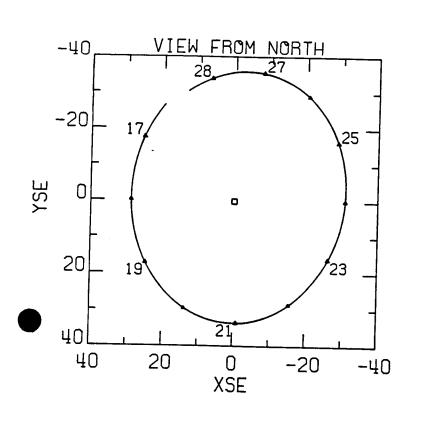
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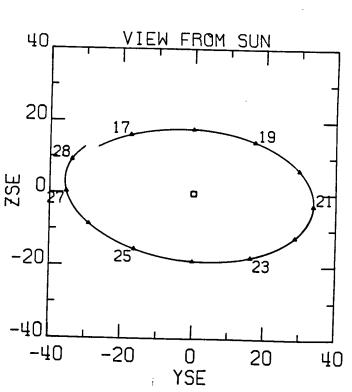
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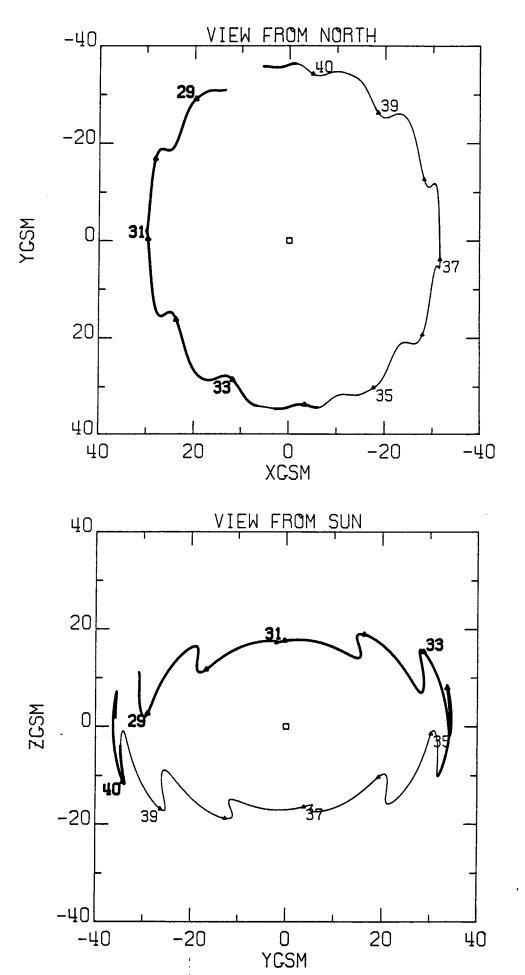


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FROM JAN 16 TO JAN 28 1973
DAYS 16 THRU 28

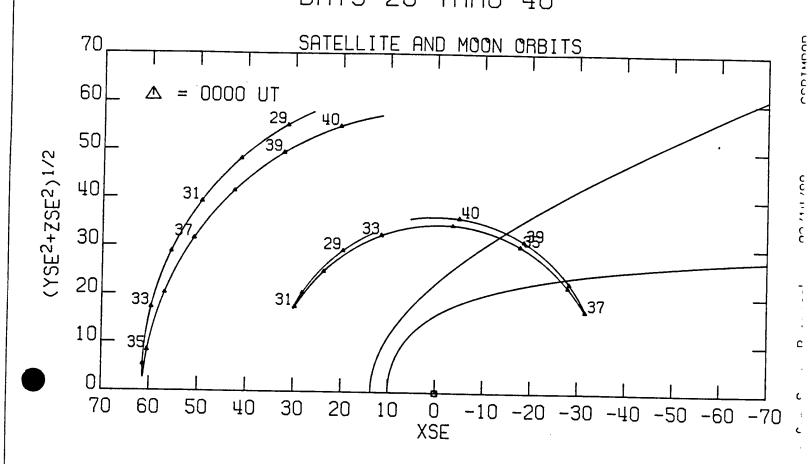


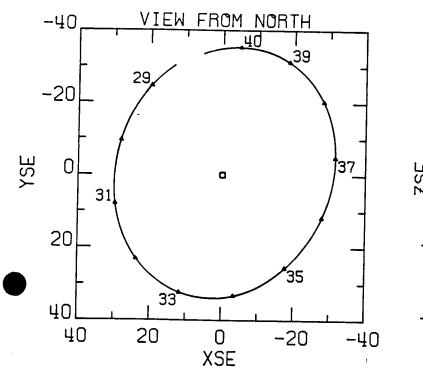


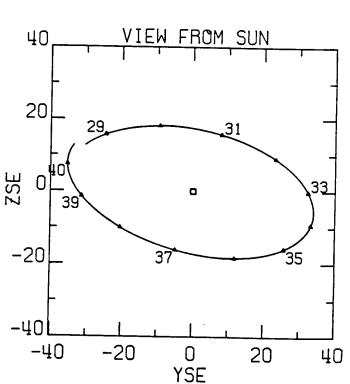


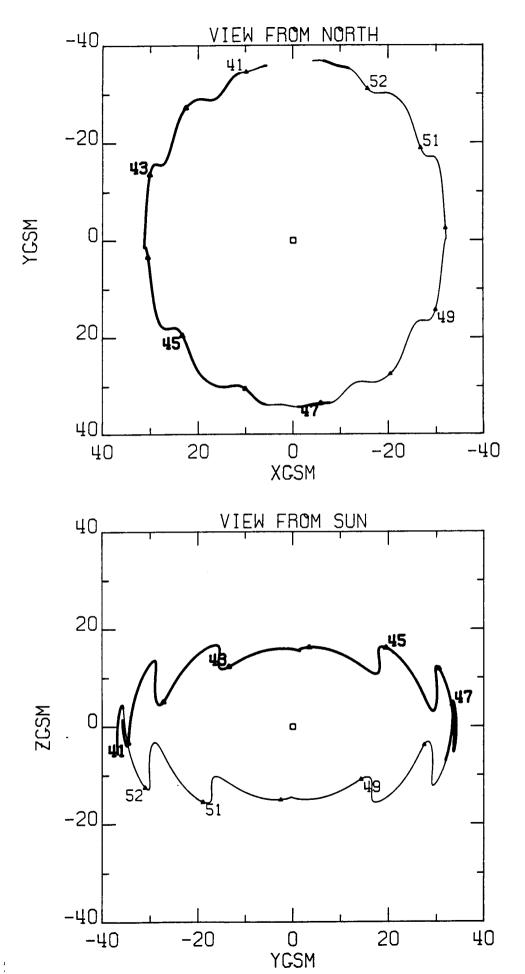


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FROM JAN 28 TO FEB 9 1973
DAYS 28 THRU 40





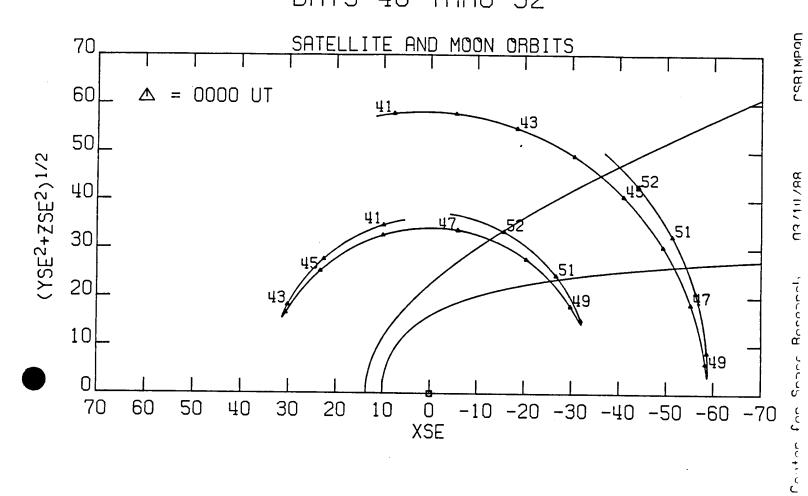


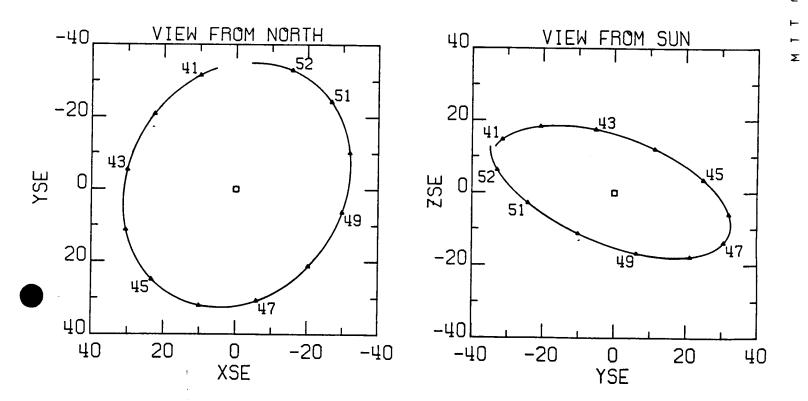


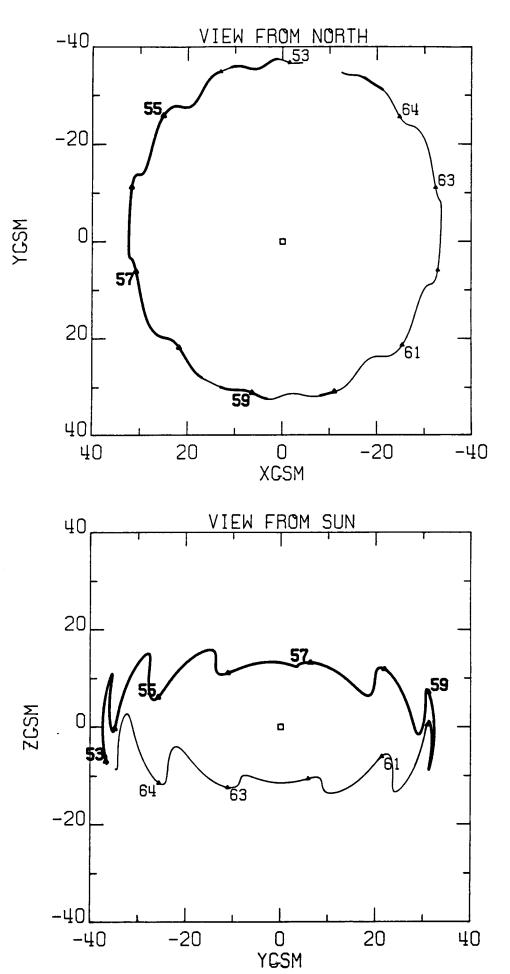
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FROM FEB 9 TO FEB 21 1973

DAYS 40 THRU 52







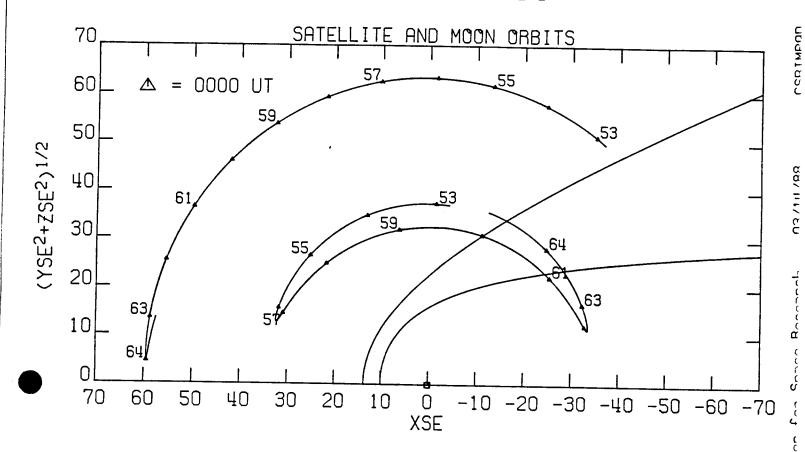
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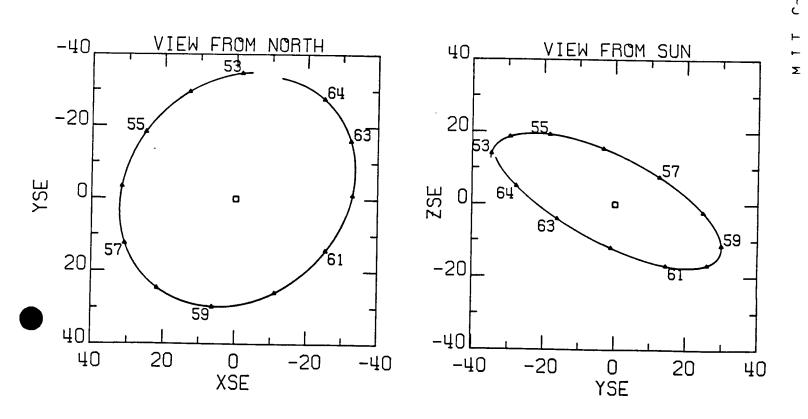
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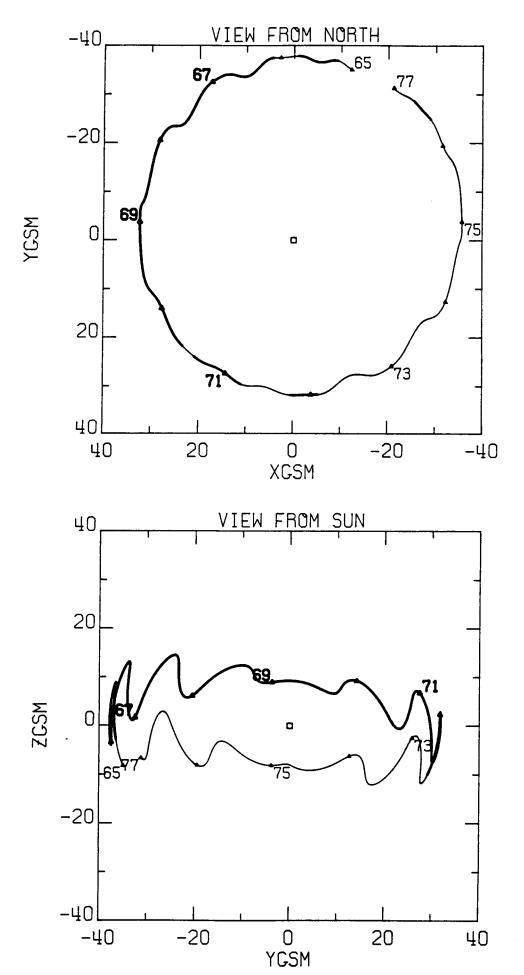
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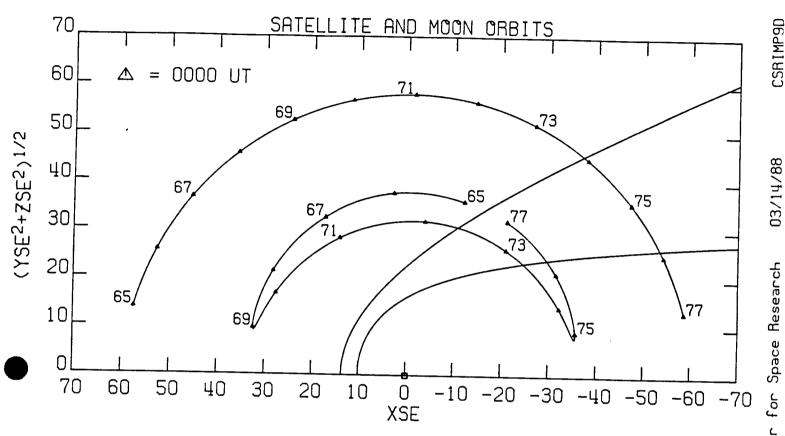
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FROM FEB 21 TO MAR 5 1973
DAYS 52 THRU 64

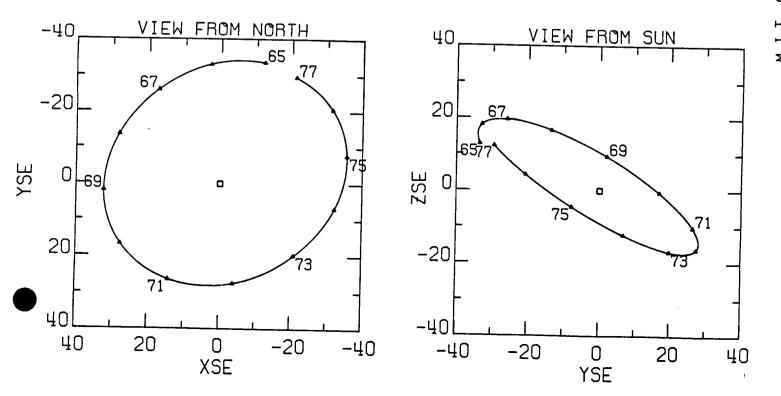






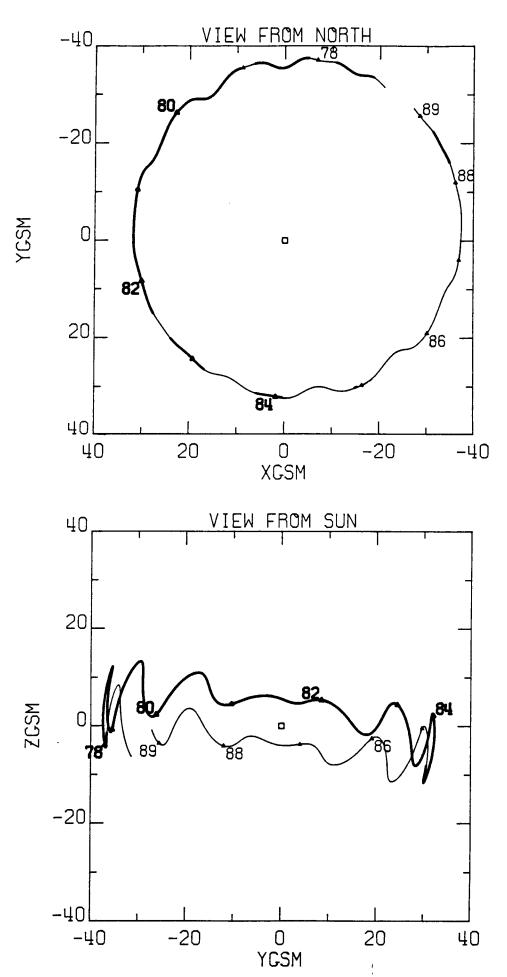
IMP 7 TRAJECTORY. ASCENDING NODE 14 FROM MAR 5 TO MAR 18 1973 DAYS 64 THRU





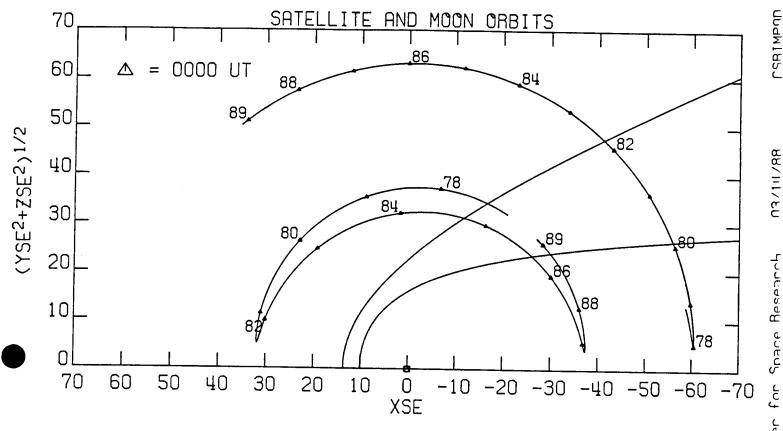
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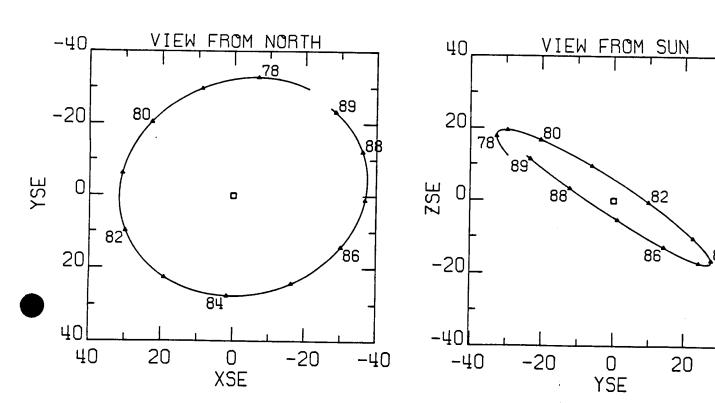
M.I.T. Center for Space Research



IMP 7 TRAJECTORY. ASCENDING NODE 15 FROM MAR 18 TO MAR 30 1973

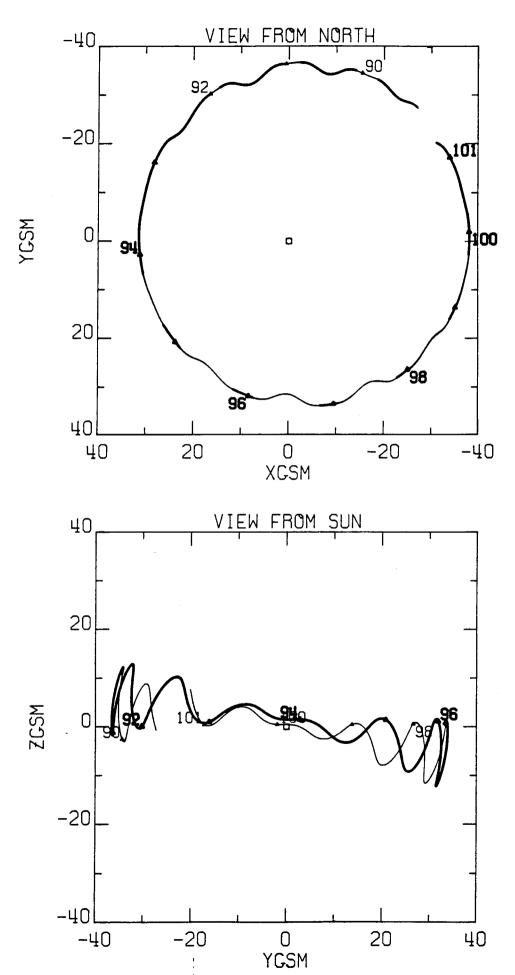
DAYS 77 THRU 89





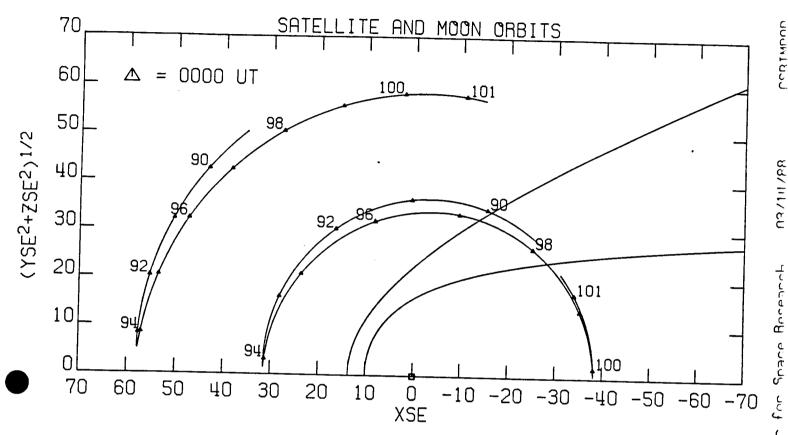
M.I.I. Center for Space Research

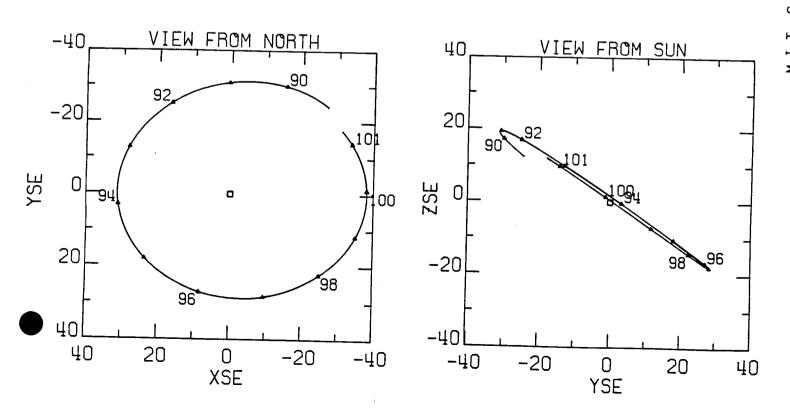
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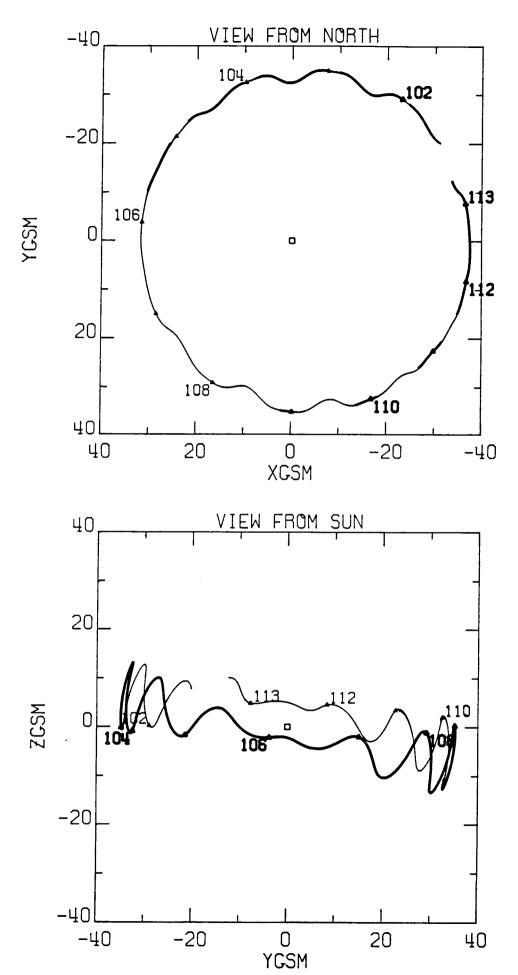
7 TRAJECTORY. ASCENDING NODE 16

FROM MAR 30 TO APR 11 1973 DAYS 89 THRU 101

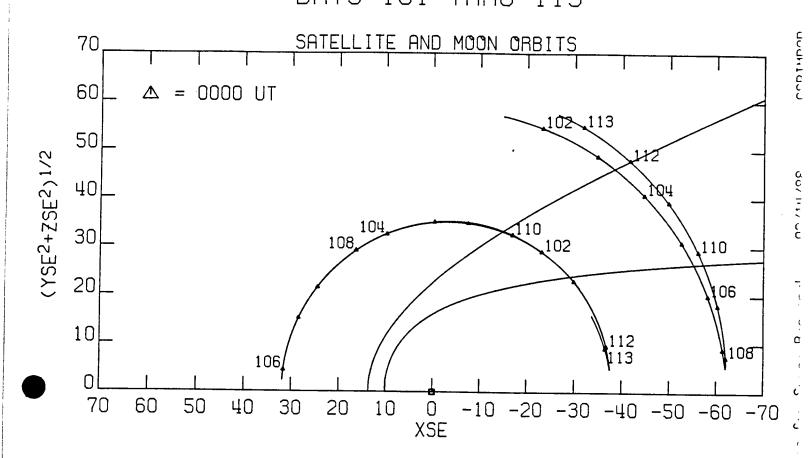


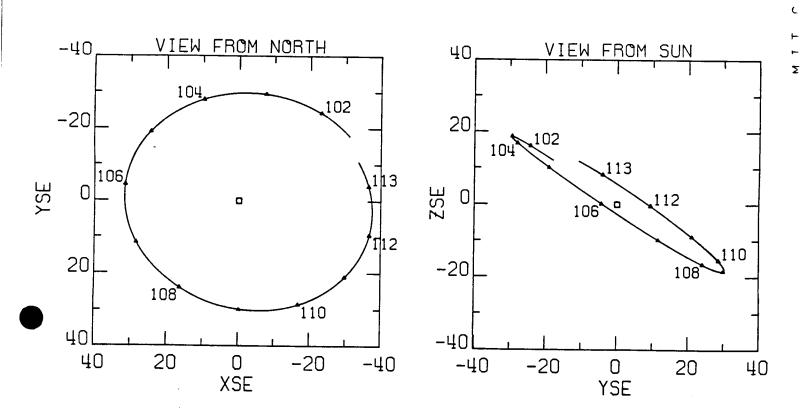


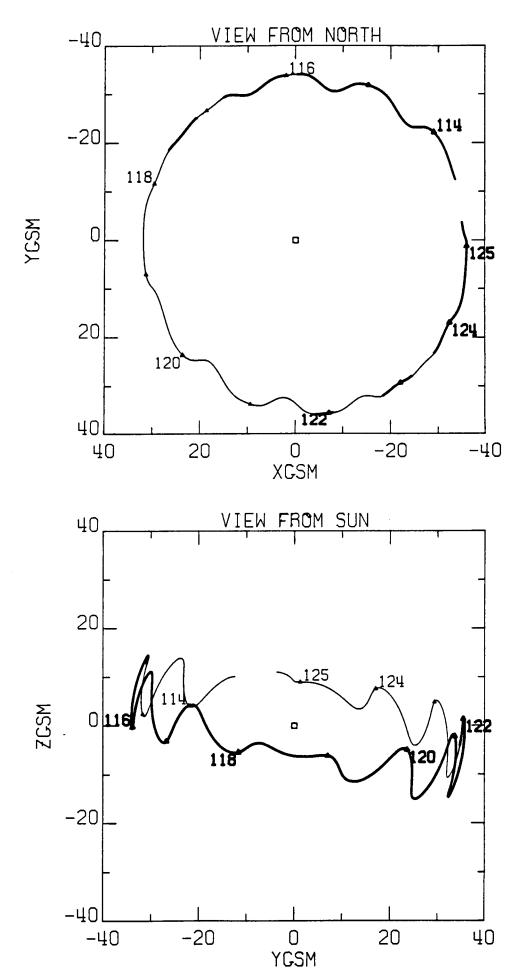
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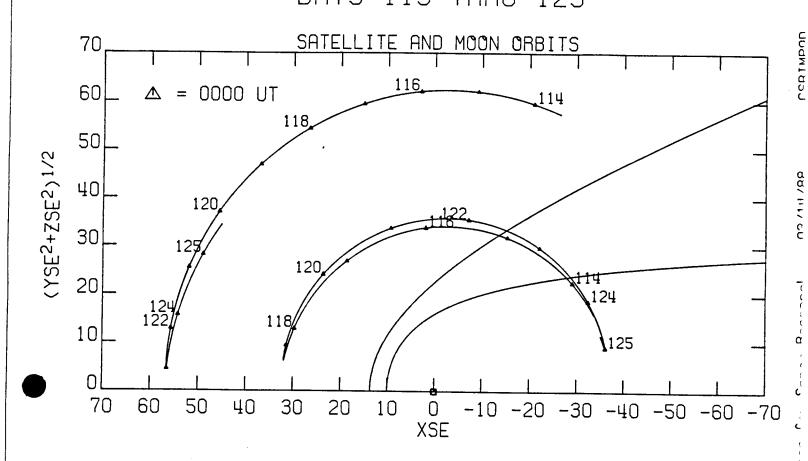
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FROM APR 11 TO APR 23 1973
DAYS 101 THRU 113

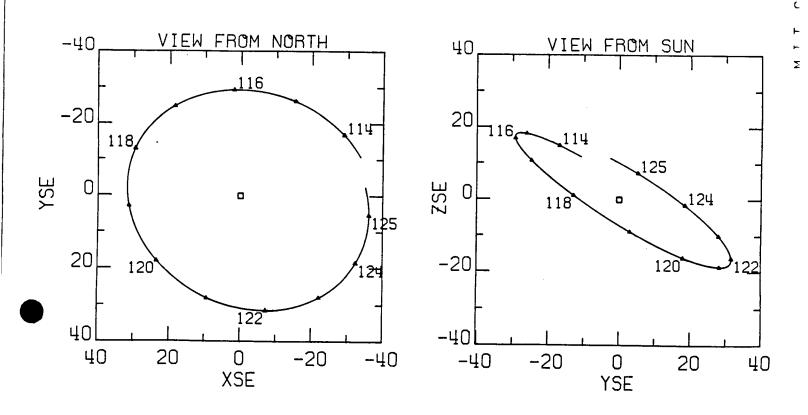


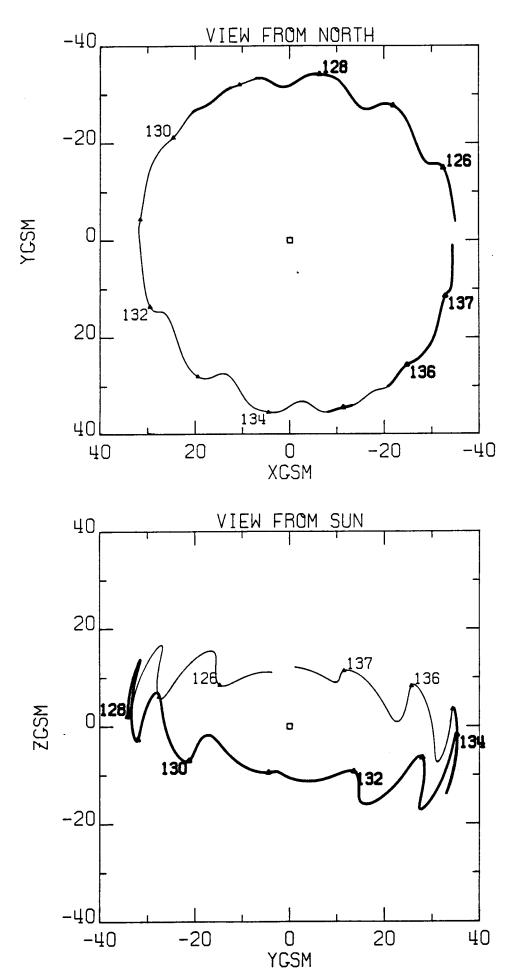




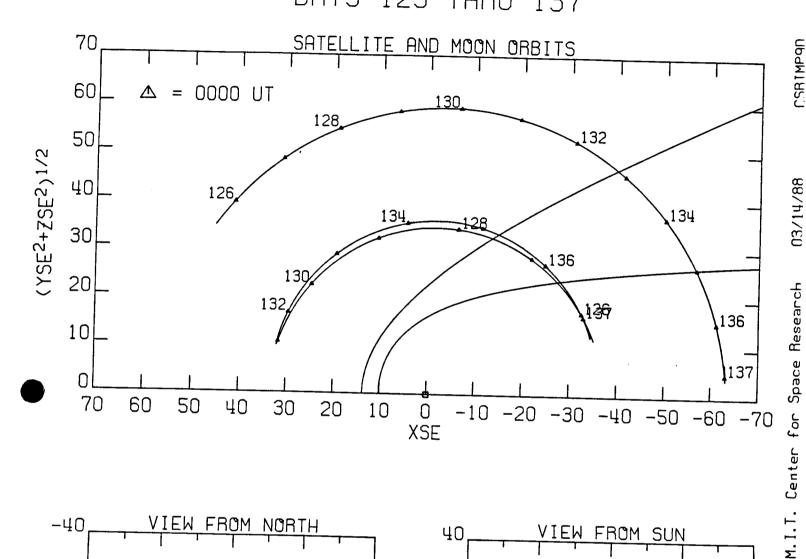
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FROM APR 23 TO MAY 5 1973
DAYS 113 THRU 125

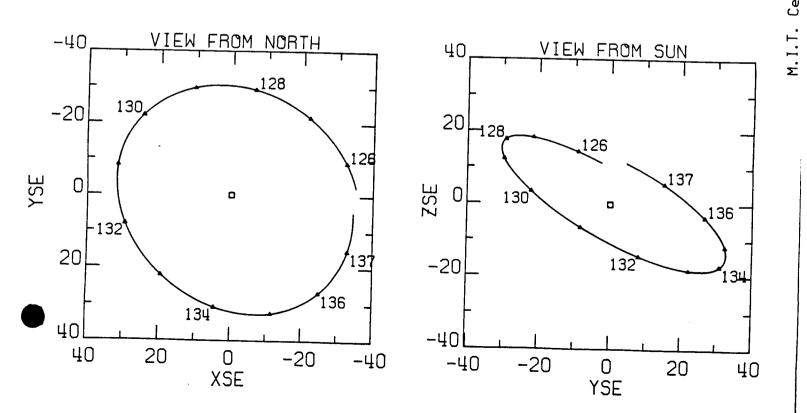


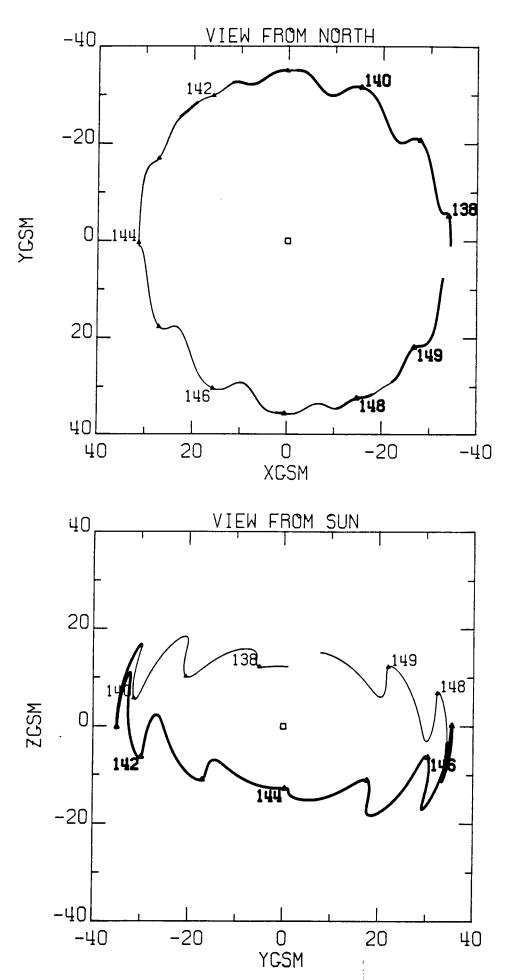




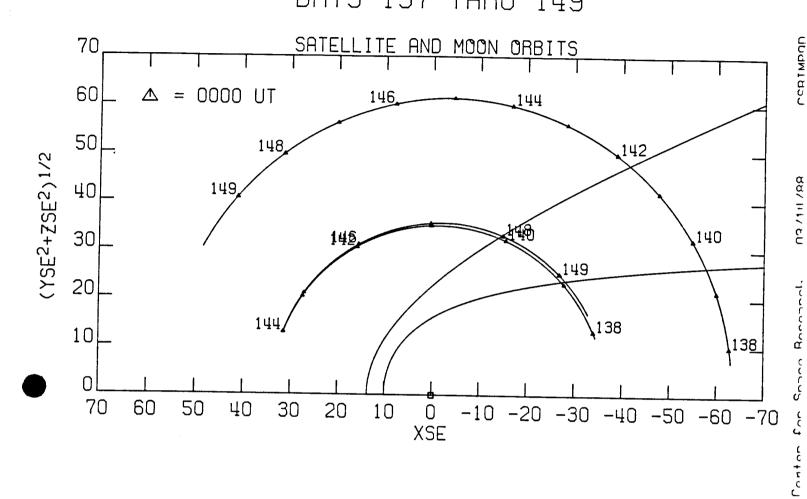
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FROM MAY 5 TO MAY 17 1973
DAYS 125 THRU 137

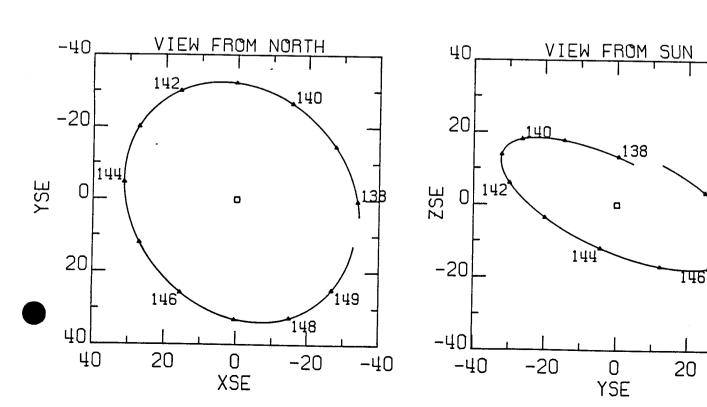


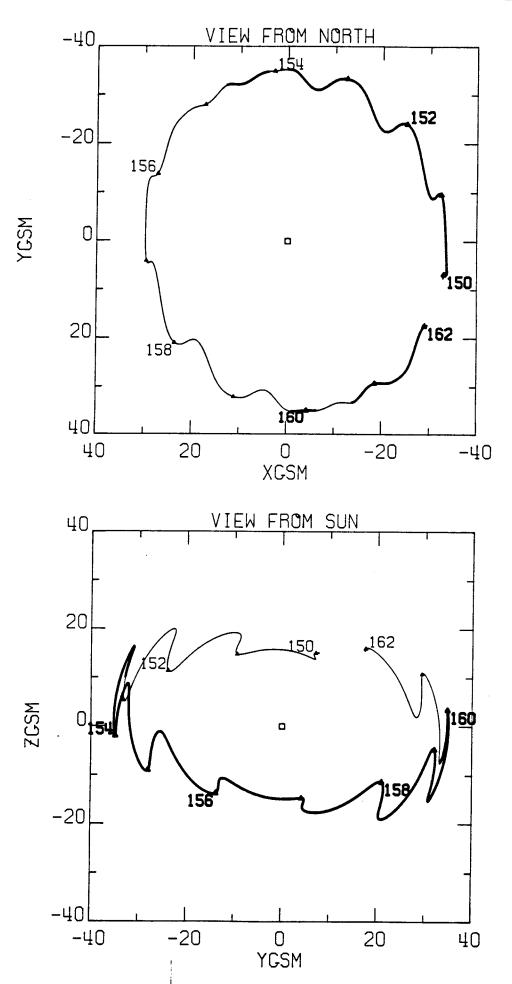




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FROM MAY 17 TO MAY 29 1973
DAYS 137 THRU 149

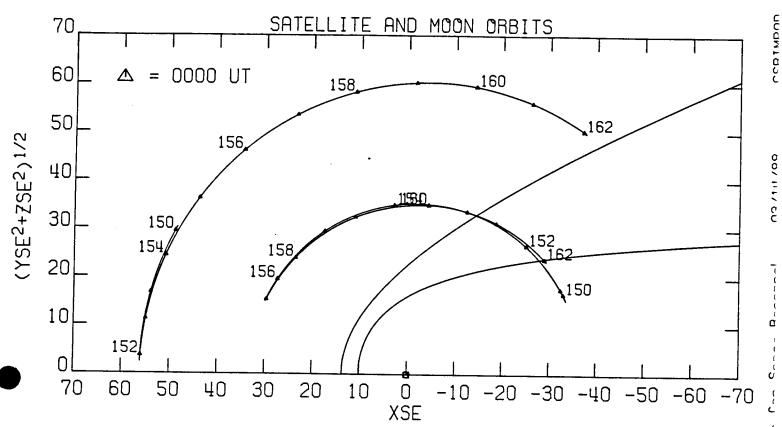


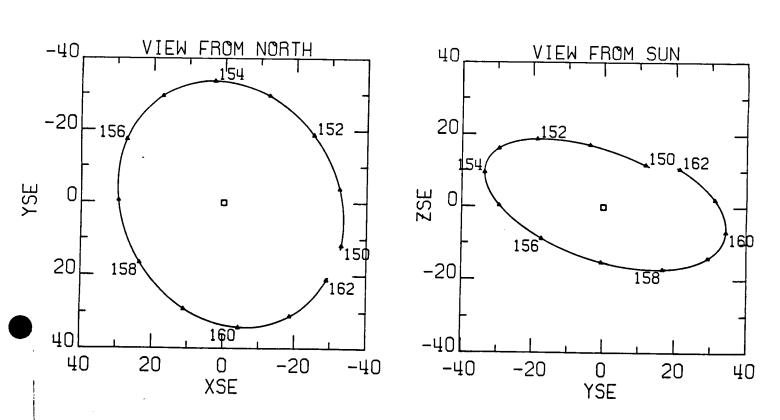


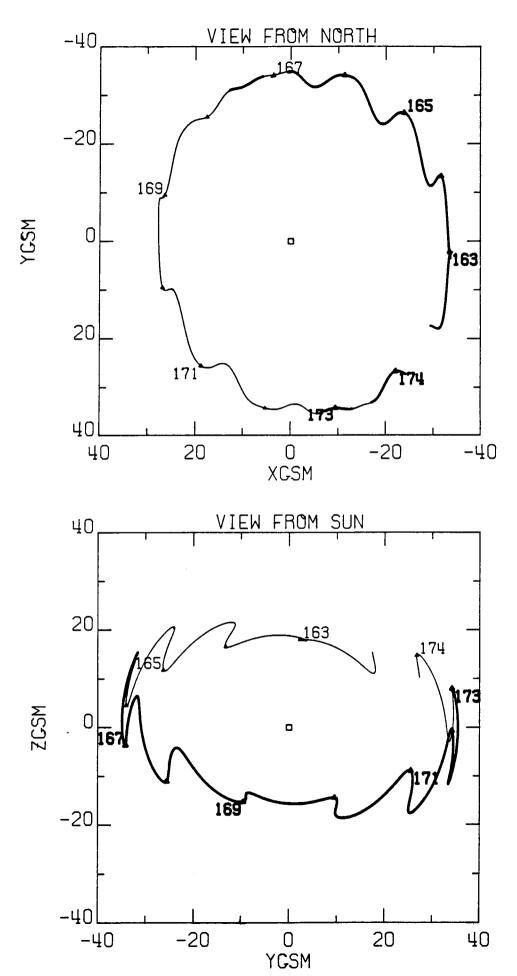


7 TRAJECTORY. ASCENDING NODE 21

> FROM MAY 29 TO JUN 11 DAYS 149 THRU

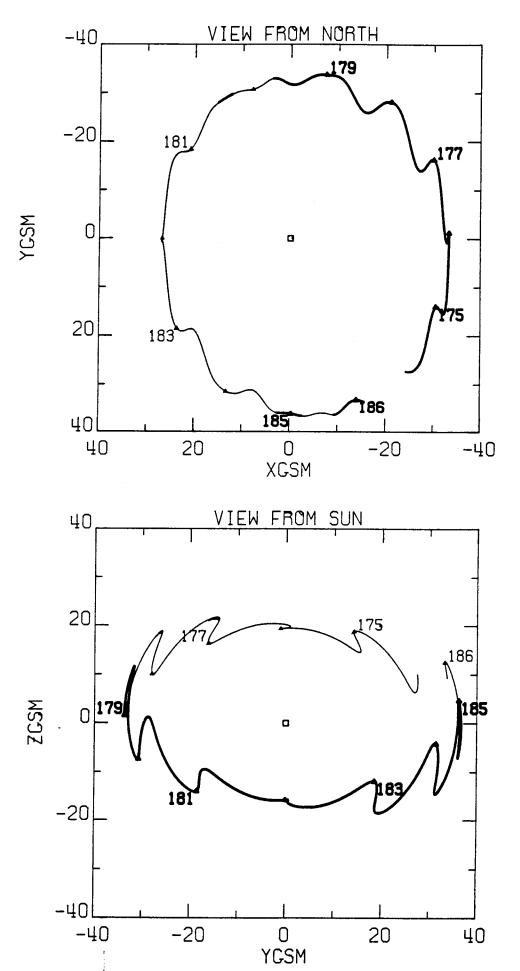




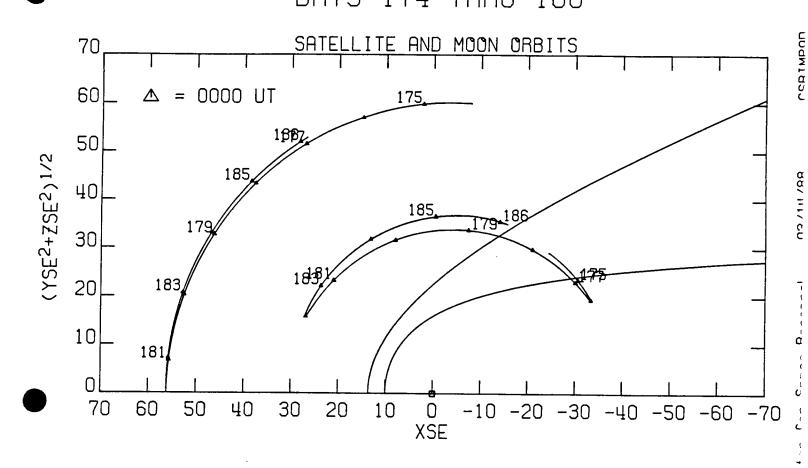


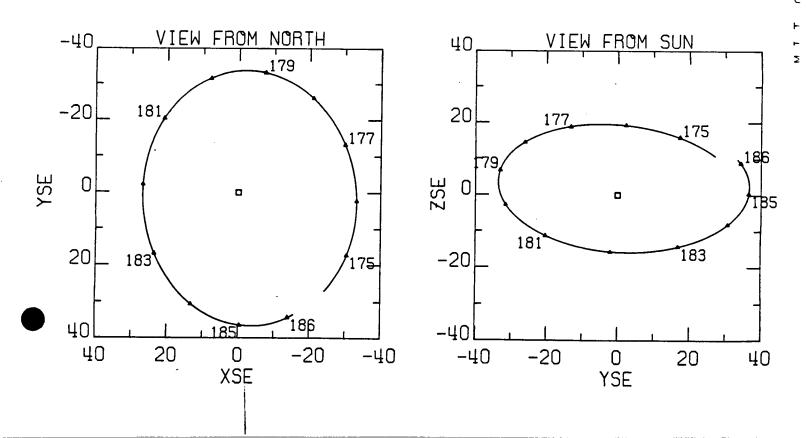
7 TRAJECTORY. ASCENDING NODE 22 FROM JUN 11 TO JUN 23 1973 DAYS 162 THRU CSR I MP9D AND 70 MOON ORBITS 60 0000 UT 174 173 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 171 163 03/14/88 40 30 1745 171 <del>169</del> 165 Space Research 20 163 169 10 167 70 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 M.I.T. Center for -60 -70 XSE VIEW FROM NORTH -40 VIEW FROM SUN 40 165 -20 20 165 163 169 174. 167 ZSE. 0 173 163 169 20 171 -20 171 **1**74 40 173 -40 0 XSE 40 20 -20 -40 -40 -20 0 20 40 YSE

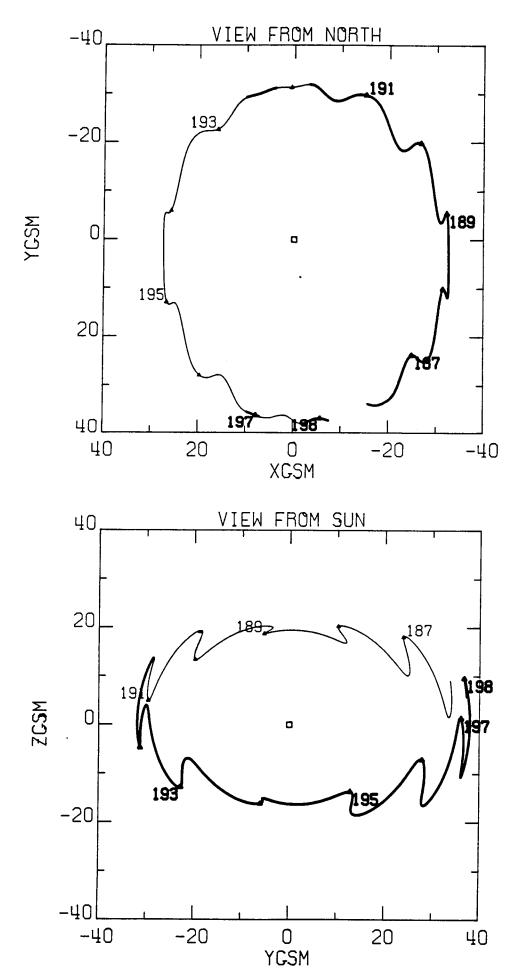
YSE



IMP 7 TRAJECTORY. ASCENDING NODE 23
FROM JUN 23 TO JUL 5 1973
DAYS 174 THRU 186



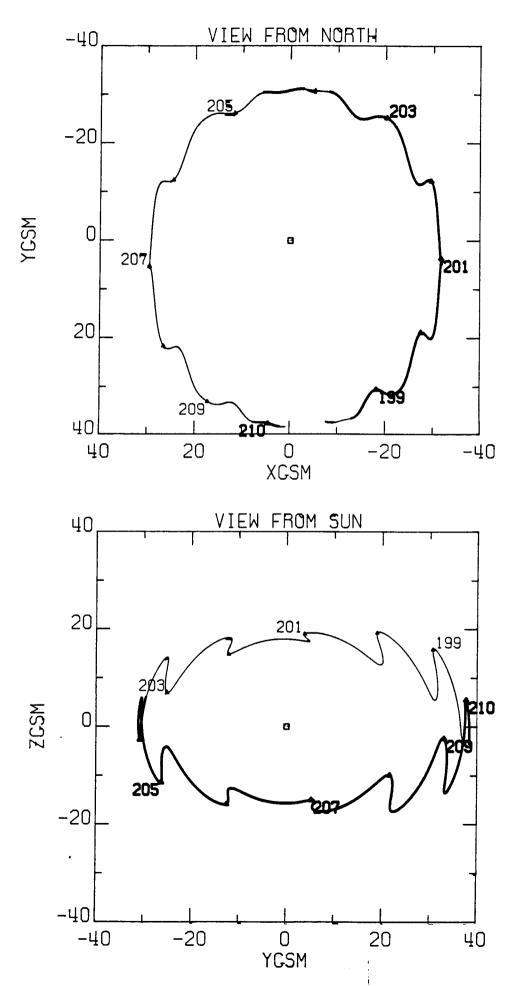




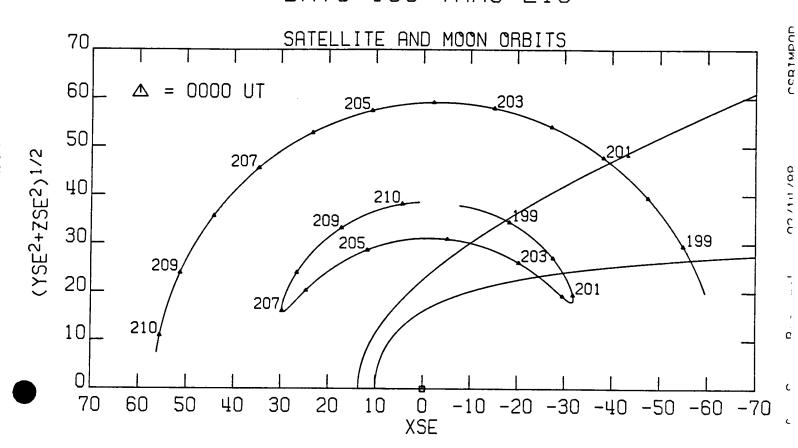
TRAJECTORY. ASCENDING NODE 24 TO JUL FROM JUL 5 DAYS THRU CSR I MP9D SATELLITE AND MOON ORBITS 0000 UT 03/14/88 198. M.I.T. Center for Space Research **)**189 XSE -10 -20 -30 -40 -50 -60 -70 VIEW FROM NORTH VIEW FROM SUN -40 -20 ZSE -20 XSE -20 -20 -40 -40 YSE

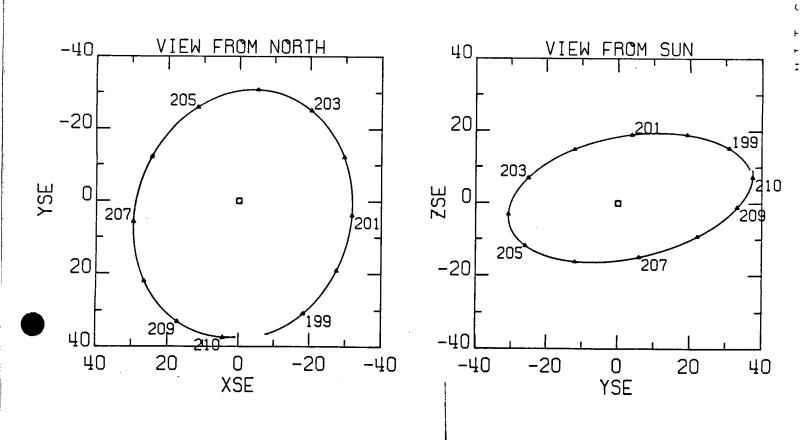
(YSE<sup>2</sup>+2SE<sup>2</sup>)<sup>1/2</sup>

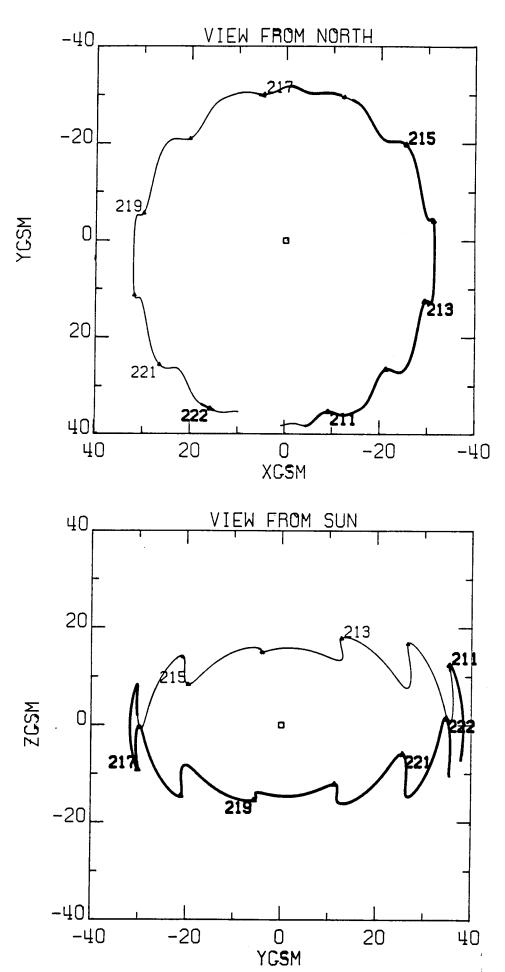
YSE



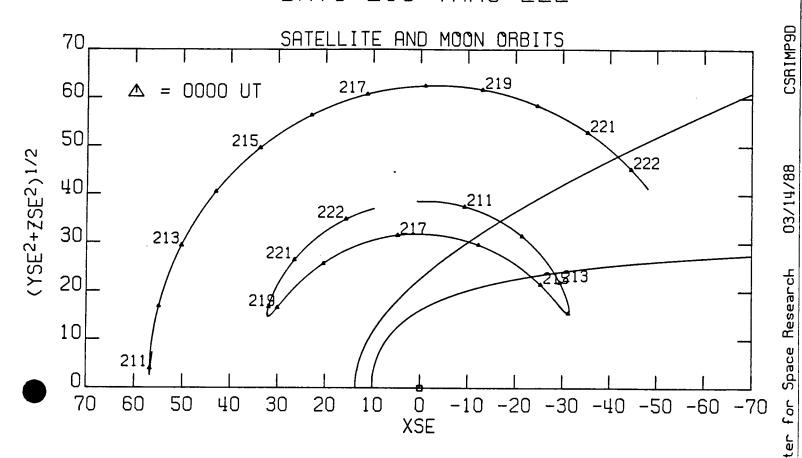
IMP 7 TRAJECTORY. ASCENDING NODE 25
FROM JUL 17 TO JUL 29 1973
DAYS 198 THRU 210

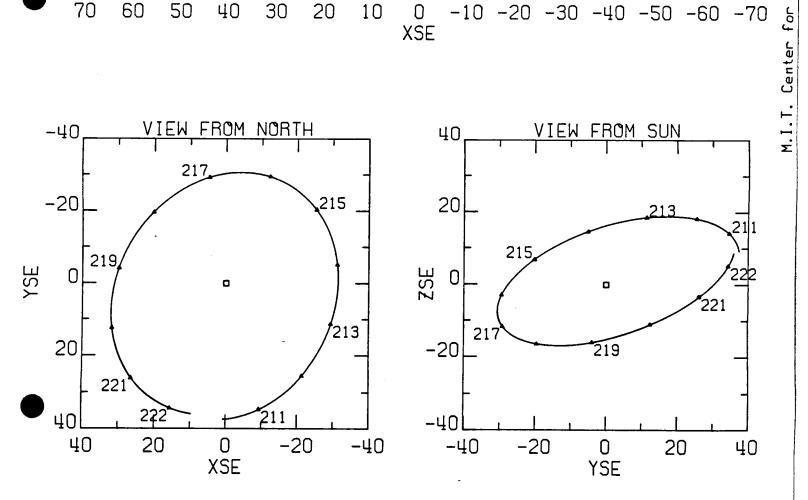


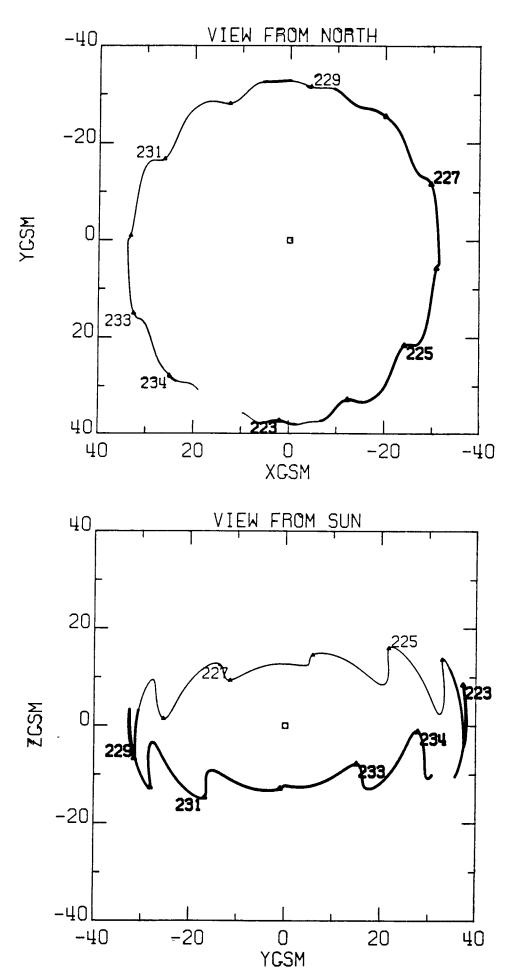




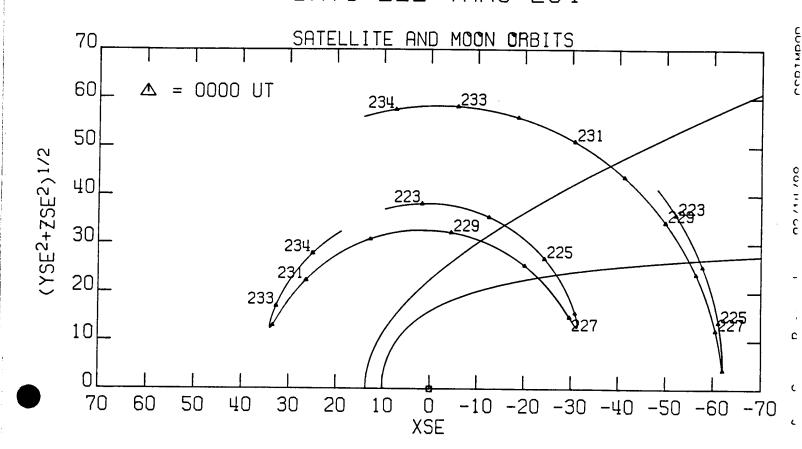
FROM JUL 29 TO AUG 10 1973 DAYS 210 THRU 222

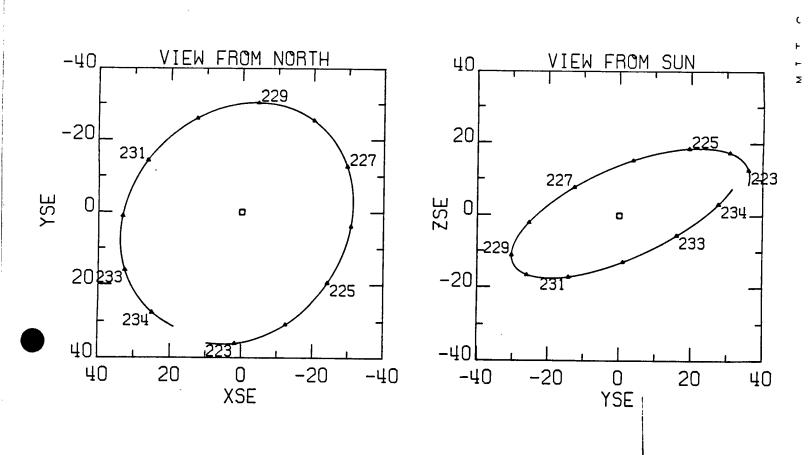


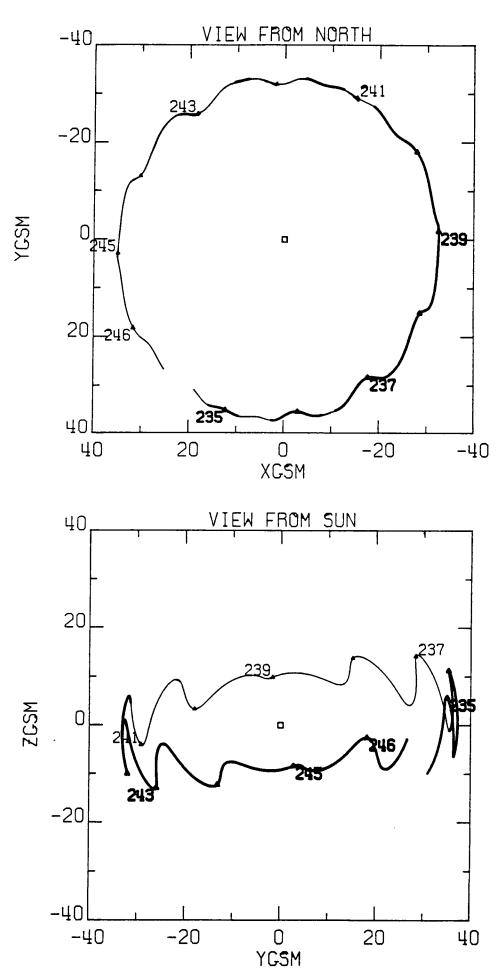




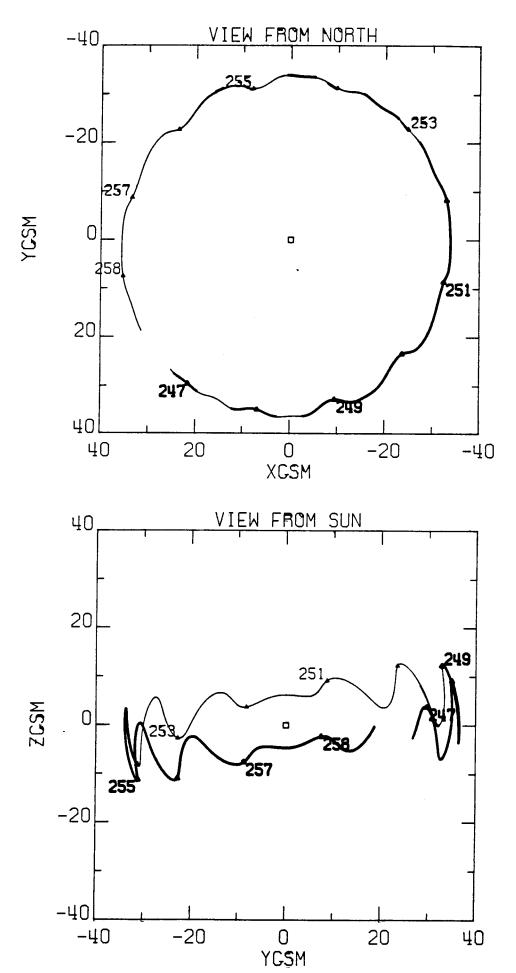
## FROM AUG 10 TO AUG 22 1973 DAYS 222 THRU 234



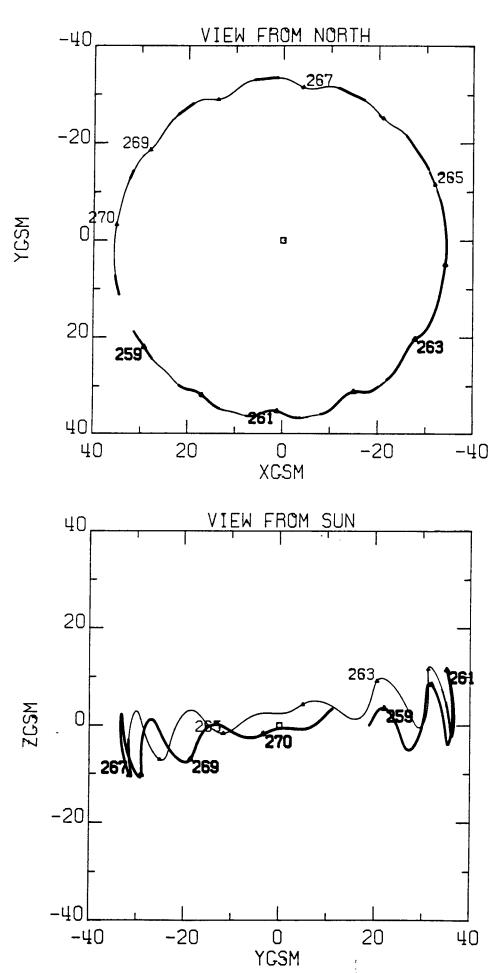




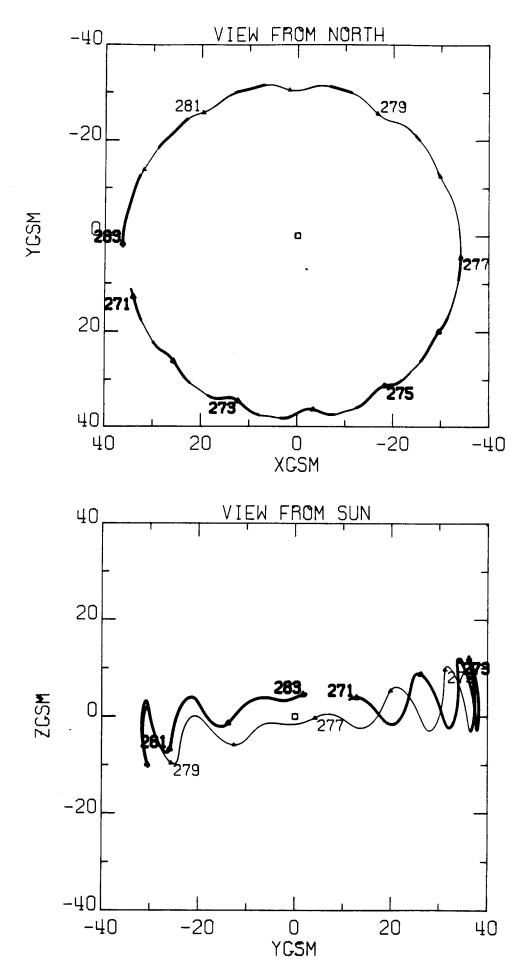
TRAJECTORY. IMP ASCENDING NODE 28 FROM AUG 22 TO SEP 3 DAYS 234 THRU 246 CSR IMP9D SATELLITE AND MOON ORBITS 70 60 0000 UT 246 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup> 03/14/88 40 243/ 30 243 M.I.T. Center for Space Research 20 246 10 **\**239 245 70 60 50 30 -20 -30 -40 40 20 10 0 -10 -50 -60 **XSE** VIEW FROM NORTH -40 VIEW FROM SUN 40 243 -20 20 237 239 235 YSE ZSE 0|-2|15 239 0 246 241 245 20 246 -20 237 235 40 -40 0 XSE 40 20 0 YSE -20 -40 -40 -20 20 40



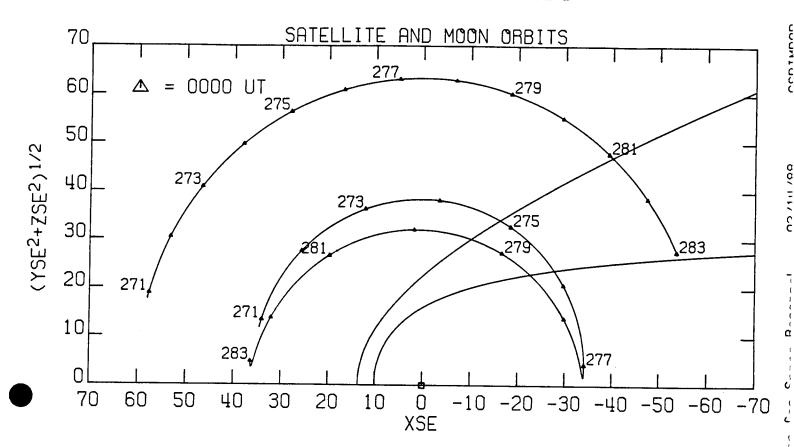
7 TRAJECTORY. ASCENDING NODE 29 FROM SEP 3 TO SEP 15 1973 DAYS 246 THRU 258 SATELLITE AND MOON ORBITS 70 247 0000 UT 60 50 251 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 A8/111/FD 40 30 247 20 \$57 251 10 255 10 Ō XSE 70 60 50 40 30 20 -20 -30 -50 -10 -40 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 255 253 -20 20 249 251 247 YSE ZSE 0 ٥ 258 2\$8 253 **`**251 257 20 -20 255 247 249 40 -40 40 20 0 -20 -40 -40 -20 0 YSE 20 40 **XSE** 

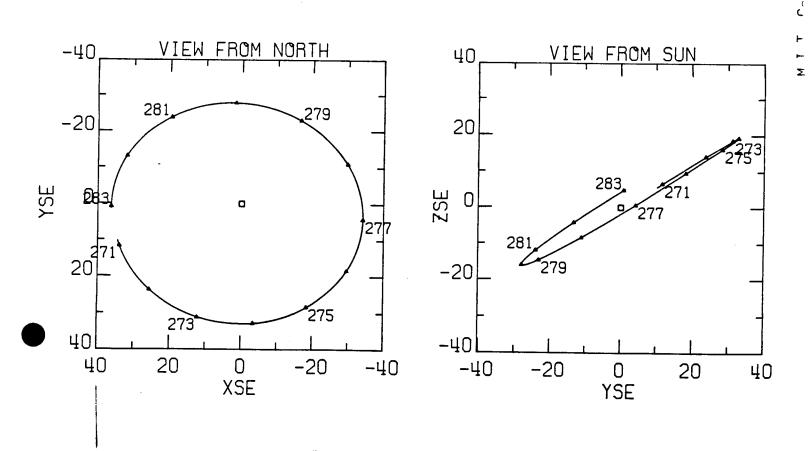


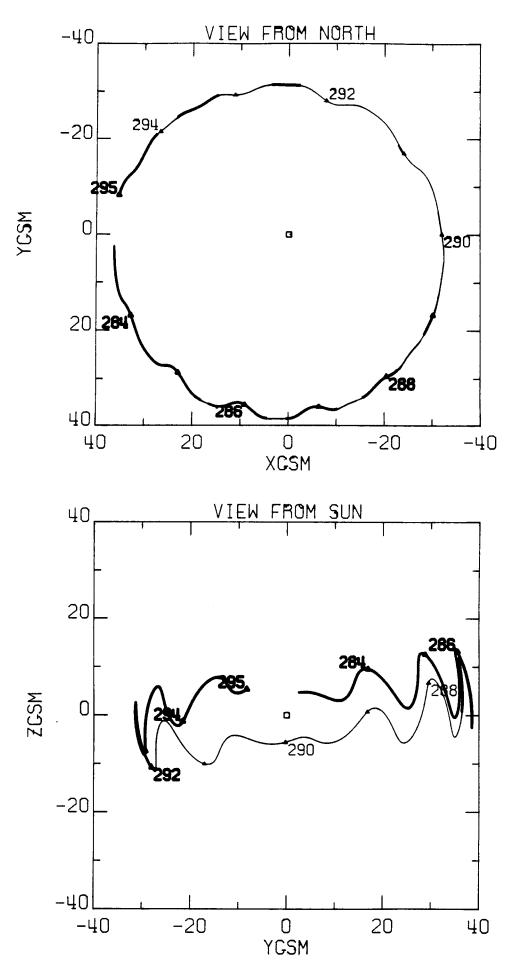
7 TRAJECTORY. IMP ASCENDING NODE 30 FROM SEP 15 TO SEP 27 1973 DAYS 258 THRU 270 CSR I MP9D <u>ITE AND MOON ORBITS</u> 70 60 0000 UT 263 261 50 265  $(YSE^2 + ZSE^2)^{1/2}$ 03/14/88 40 259 261 267 267 30 <del>263</del> M.I.T. Center for Space Research 20 265 10 70 60 50 40 30 20 -30 10 0 -10 -20 -40 -50 -60 **XSE** VIEW FROM SUN VIEW FROM NORTH -40 40 267 -20 20 269 261 263 265 37 259 YSE ZSE 0 265 270 269 267 -20 20 263 261 40 -40 O YSE 0 XSE 20 -20 40 -40 -40 -20 20 40



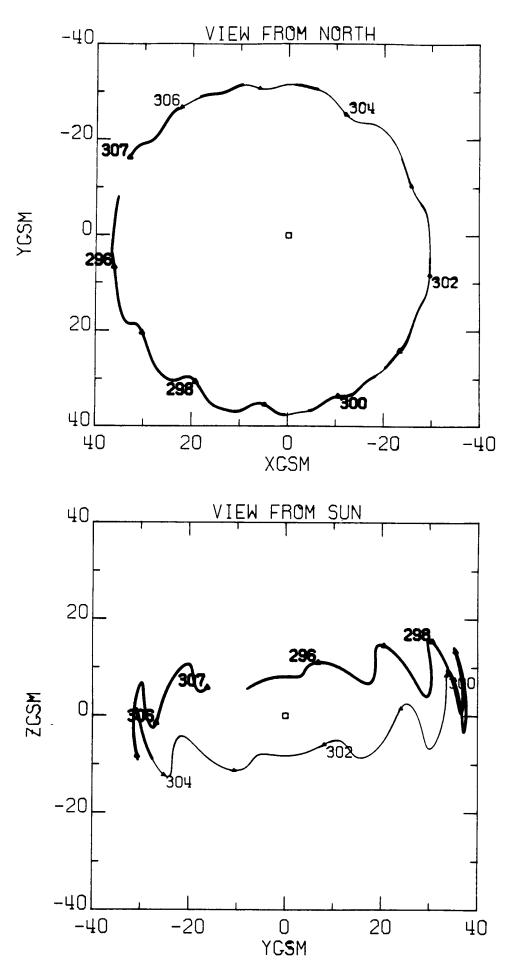
FROM SEP 27 TO OCT 10 1973
DAYS 270 THRU 283



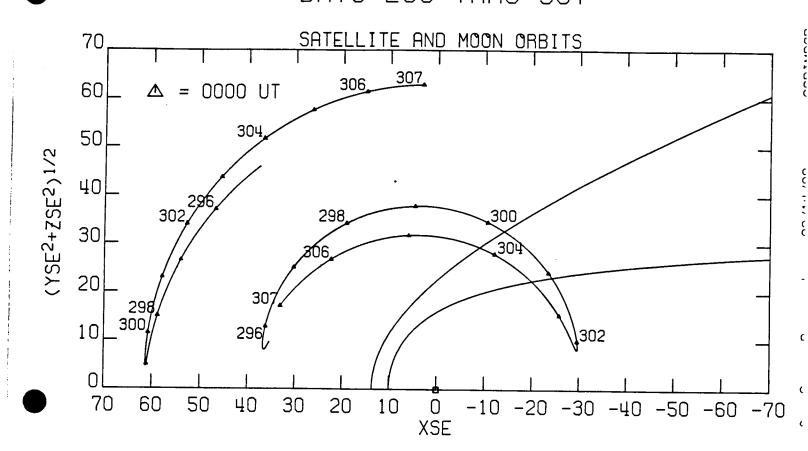


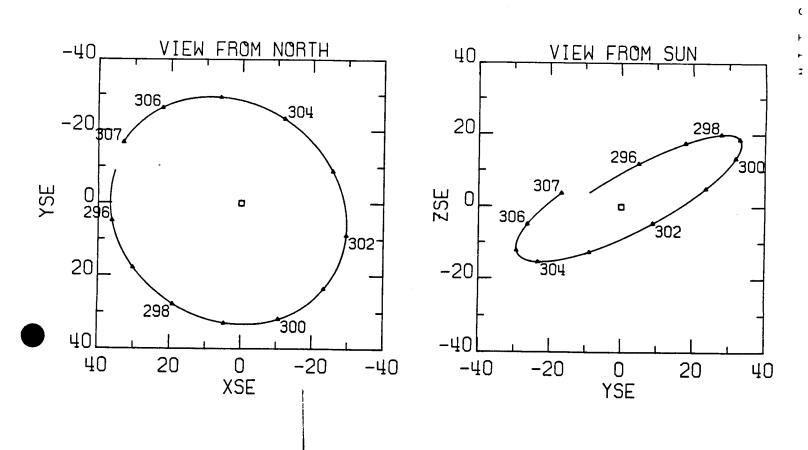


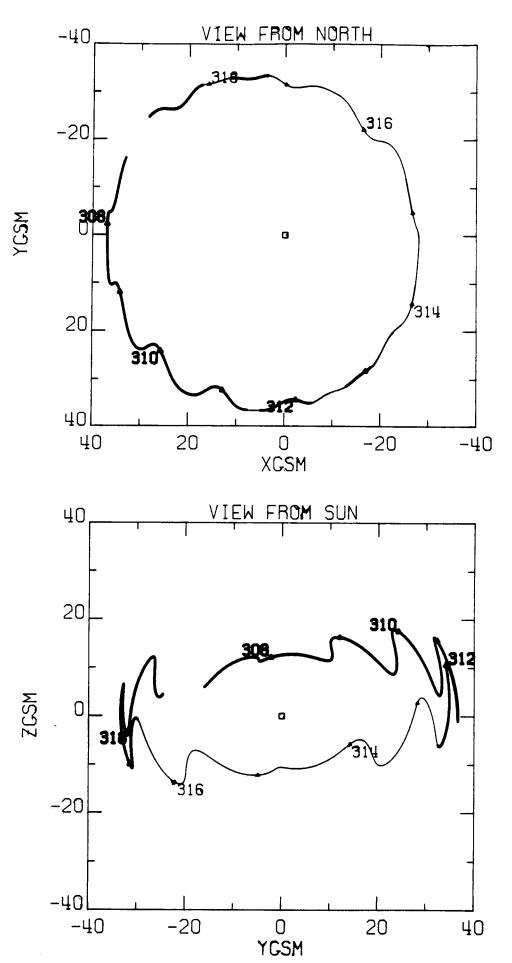
TRAJECTORY. ASCENDING NODE 32 FROM OCT 10 TO OCT 22 1973 DAYS 283 **THRU 295** CSRIMP9D SATELLITE AND MOON ORBITS 70 60 0000 UT 292 294 290 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 295, 03/14/88 40 286 288 30 288 292 28439 M.I.T. Center for Space Research 20 10 295 vb90 0 50 70 30 Ö XSE 60 40 20 10 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH VIEW FROM SUN -40 40 292 -20 294 20 286 284 295 288 295 YSE ZSE 0 0 Q 290 294 290 20284 -20 292 288 286 40 -40 0 XSE 20 -40 -20 O YSE 40 -20 -40 20 40



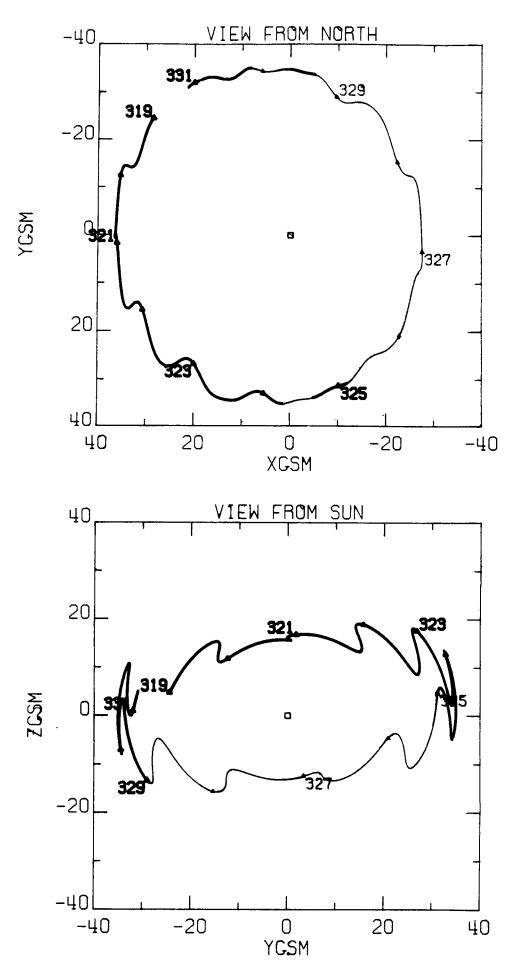
FROM OCT 22 TO NOV 3 1973 DAYS 295 THRU 307





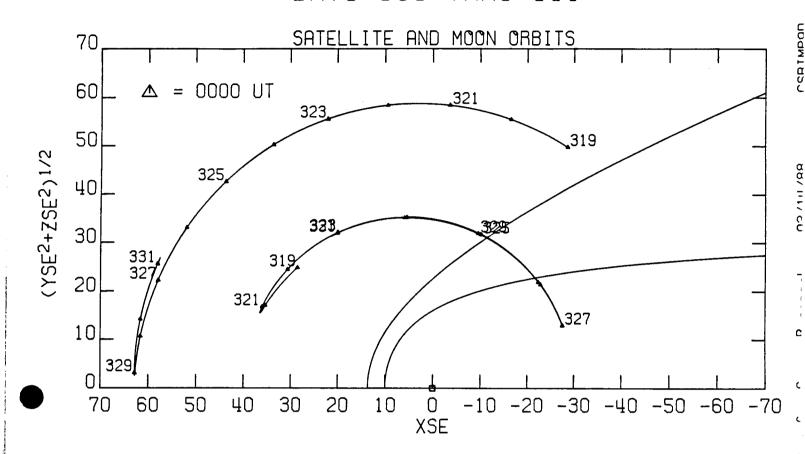


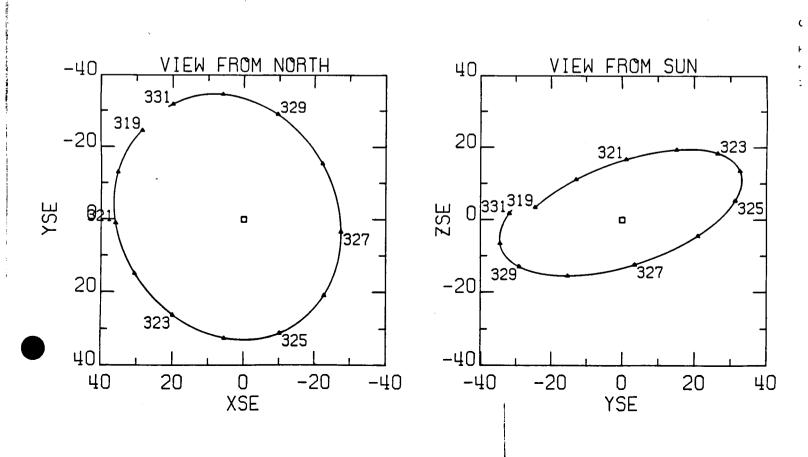
IMP 7 TRAJECTORY. ASCENDING NODE 34 FROM NOV 3 TO NOV 14 1973 DAYS 307 THRU 318 CSR I MP9D SATELLITE AND MOON ORBITS 70 308 60 0000 UT 310 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 03/14/88 **3**1/8 40 312 312 30 310 M.I.T. Center for Space Research 20 **B**16 314 308 10 1314 70 30 60 50 20 10 40 0 -10 -20 -30 -50 -40 -60 **XSE** -40 VIEW FROM NORTH VIEW FROM SUN 40 -20 316 20 310 314 308 308 YSE ZSE 0 0 314 318 20 314 316 -20 310 312 40 -40 40 20 0 -20 -40 -40 O YSE -20 20 40 XSE

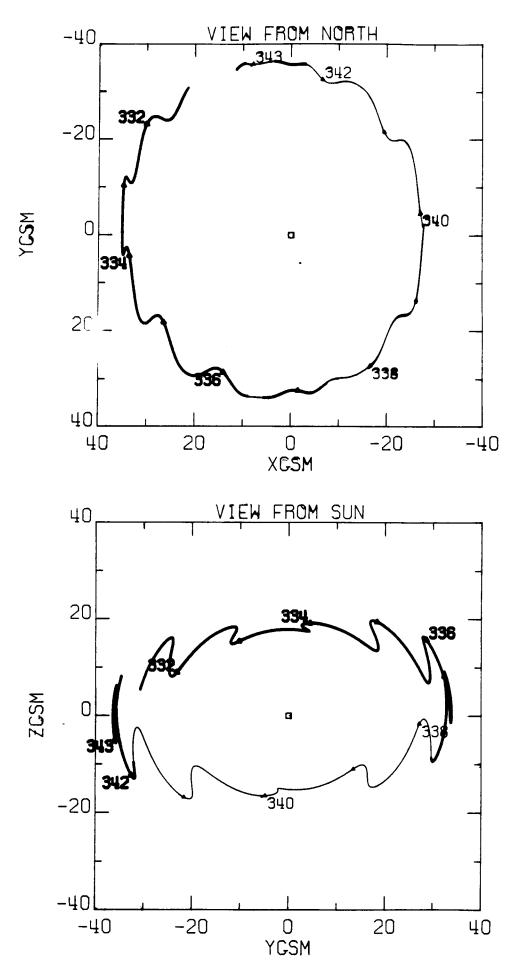


IMP 7 TRAJECTORY. ASCENDING NODE 35
FROM NOV 14 TO NOV 27 1973

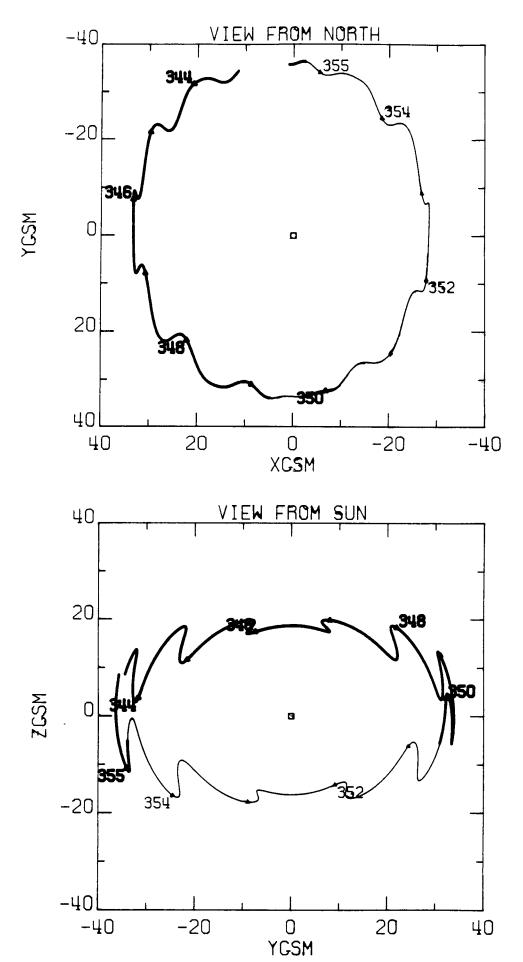
DAYS 318 THRU 331







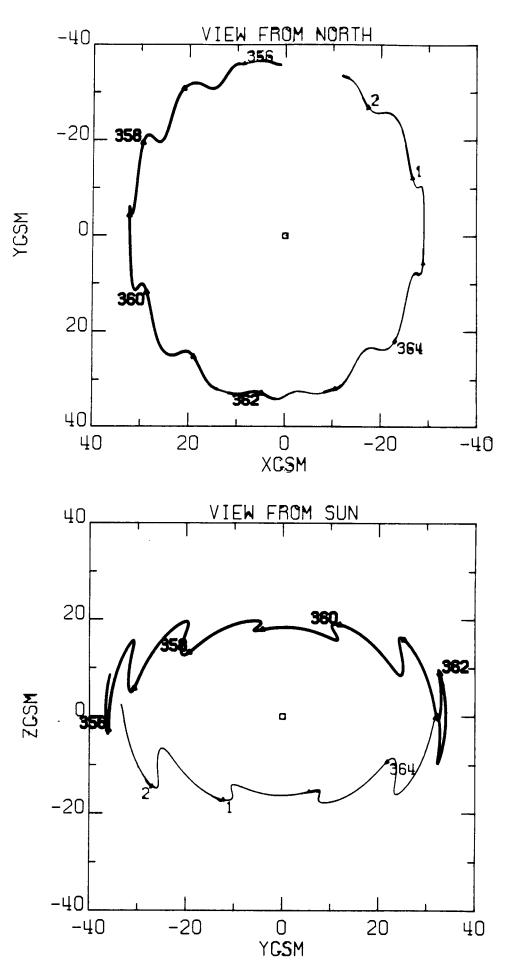
7 TRAJECTORY. IMP ASCENDING NODE 36 FROM NOV 27 TO DAYS 331 THRU 343 CSR I MP9D SATELLITE AND MOON ORBITS 70 336 0000 UT 338 60 334 50 340 (YSE<sup>2</sup>+2SE<sup>2</sup>)<sup>1/2</sup> 03/14/88 40 332 342 30 342 332 M.I.I. Center for Space Research 334/ 20 340 343 10 Ö XSE -30 -40 -50 -60 -10 -20 30 20 10 60 50 40 70 VIEW FROM SUN VIEW FROM NORTH 40 -40 332 20 -20 334 336 332 340 ZSE YSE 343 0 0 **338** 334 340 -20 20 338 336 40 40 -20 20 0 0 -40 20 -20 -40 40 YSE **XSE** 



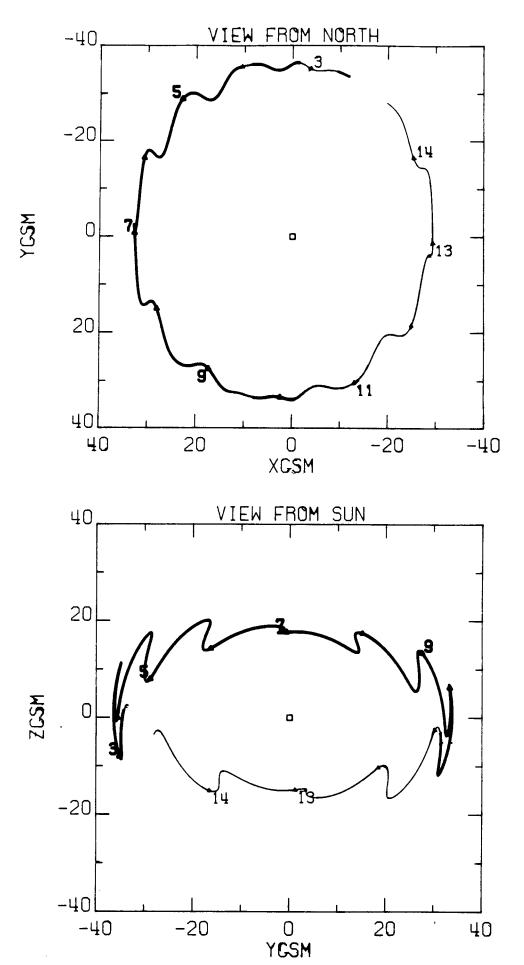
TRAJECTORY. ASCENDING NODE 37 FROM DEC 9 TO DEC 21 DAYS 343 THRU 355 CSR I MP9D SATELLITE AND MOON ORBITS 70 60 0000 UT 352 350 50 354 348 03/14/88 40 355 355 .350 30 354 Center for Space Research 20 346 **\**352 10 Ö XSE 50 30 20 70 60 40 10 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH VIEW FROM SUN -40 40 344 354 -20 20 346 348 1344 **ZSE** 0 0 350 3\$5 352 354 352 20 -20 348 350 40 0 XSE O YSE 20 -20 -20 20 40 -40 -40 40

(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2

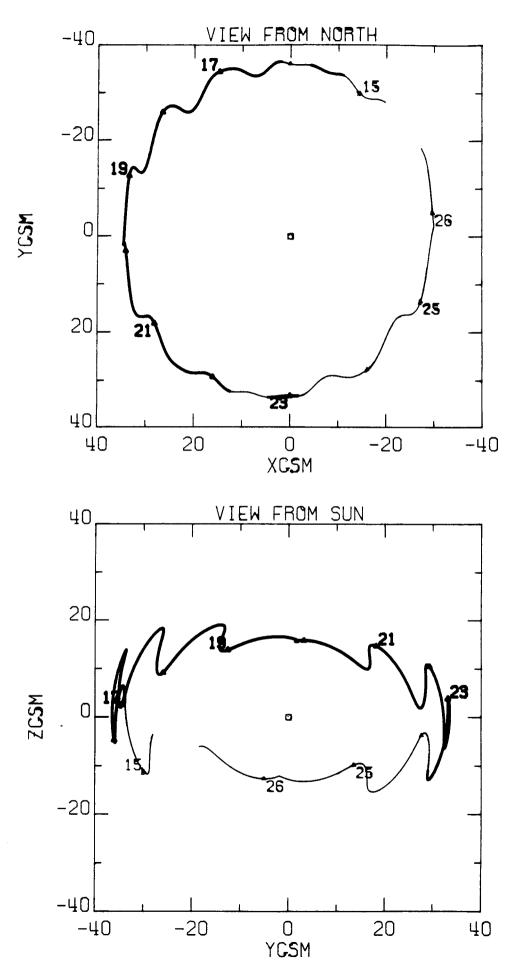
YSE



IMP 7 TRAJECTORY. ASCENDING NODE TO JAN FROM DEC 21 1974 DAYS 355 THRU CSR I MP9D AND MOON ORBITS 70 60 0000 UT 364 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup> 03/14/88 40 362 356 30 356 M.I.T. Center for Space Research 20 360 10 358 60 50 0 70 40 30 20 10 -20 -10 -30 -60 -40 -50 **XSE** VIEW FROM NORTH -40 40 -20 20 358 358 360 3**5**6 YSE ZSE 0 362 0 364 -20 20 \_360 362 40 0 XSE 20 O YSE 40 -20 20 -20 -40 -40 40

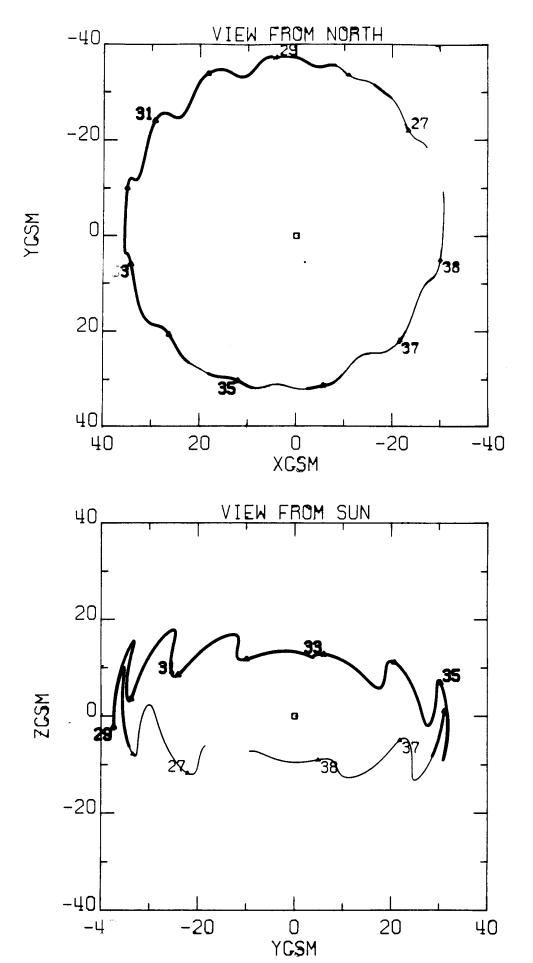


7 TRAJECTORY. ASCENDING NODE 39 FROM JAN 2 TO JAN 14 1974 DAYS 2 THRU SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup> Ö XSE -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 YSE ZSE 0 3 -20 -40 XSE -20 YSE -20 -40 -40 

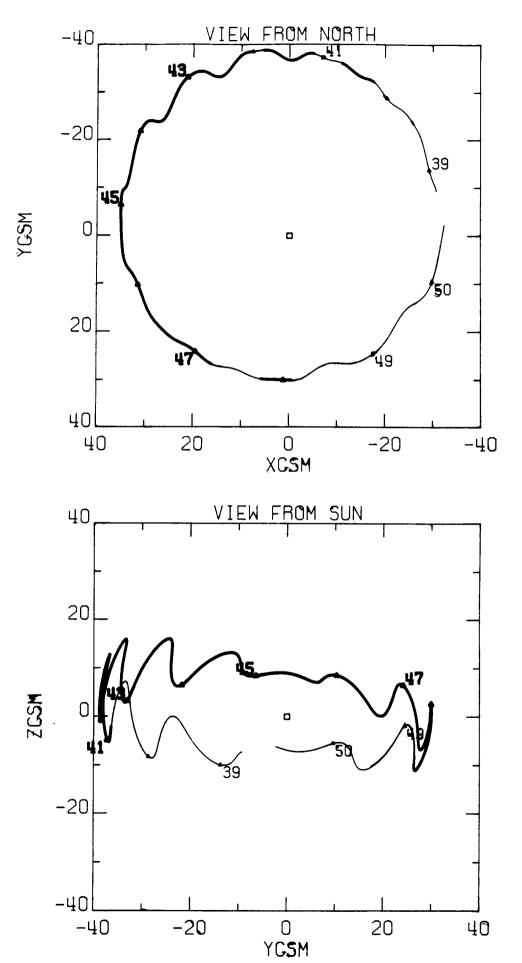


(YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup>

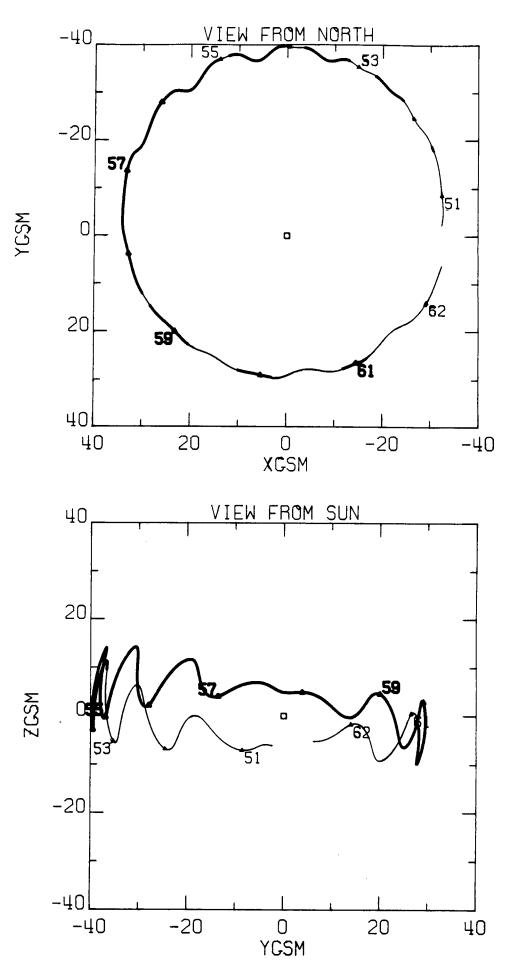
YSE



TRAJECTORY. ASCENDING NODE 41 FROM JAN 26 TO FEB 1974 DAYS 26 THRU 38 CSR I MP9D AND MOON ORBITS 70 60 0000 UT 31 33 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 03/14/88 40 29 35 30 M.I.T. Center for Space Research 20 37 10 **\**38 138 0 70 60 50 30 Ō XSE 40 20 10 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 27 -20 20 31 31 YSE 0 **ZSE** 0 0 38 27 35 33 38 20 -20 35 40 -40 0 XSE -20 40 20 0 YSE -40 -40 -20 20 40

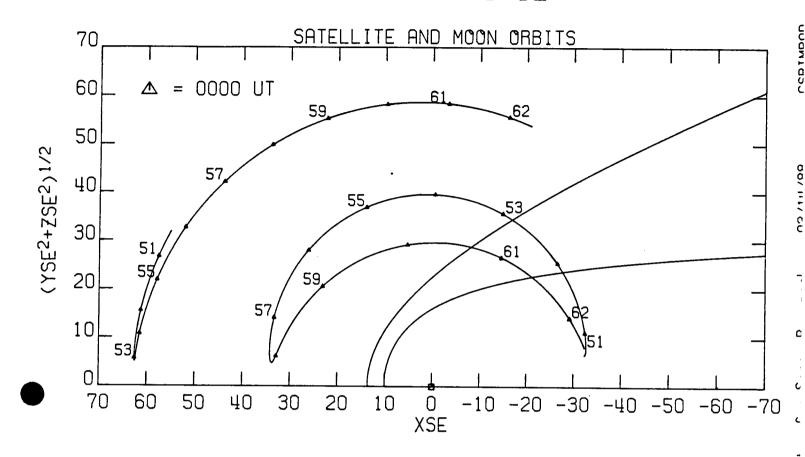


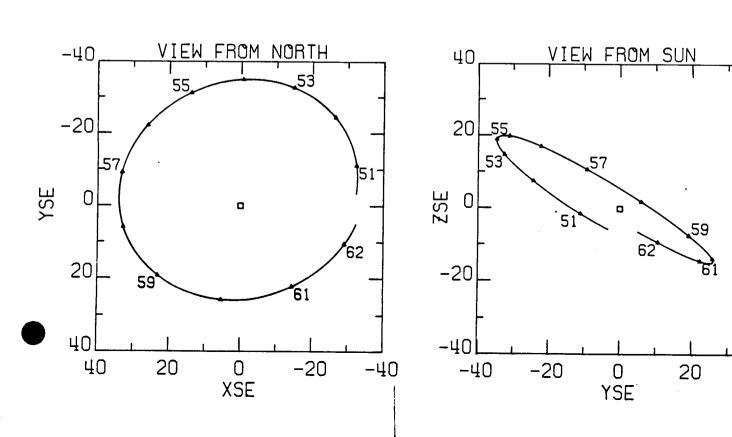
IMP 7 TRAJECTORY. ASCENDING NODE 42 FROM FEB TO FEB 7 19 1974 DAYS 38 THRU 50 AND MOON ORBITS **FSRIMPan** 70 = 0000 UT 60 47 43 50 (YSE<sup>2</sup>+2SE<sup>2</sup>)1/2 49 N3/14/88 40 41 50 41 43 30 47 20 M.I.T. Center for Snare Research 39 39 10 45 70 50 60 30 20 Ö XSE 40 10 -20 -10 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 43 -20 20 39 45 YSE 0 45 **ZSE** 0 0 39 50 50 20 -20 49 47 40 -40 20 0 XSE 40 -20 -40 -20 O YSE -40 20 40



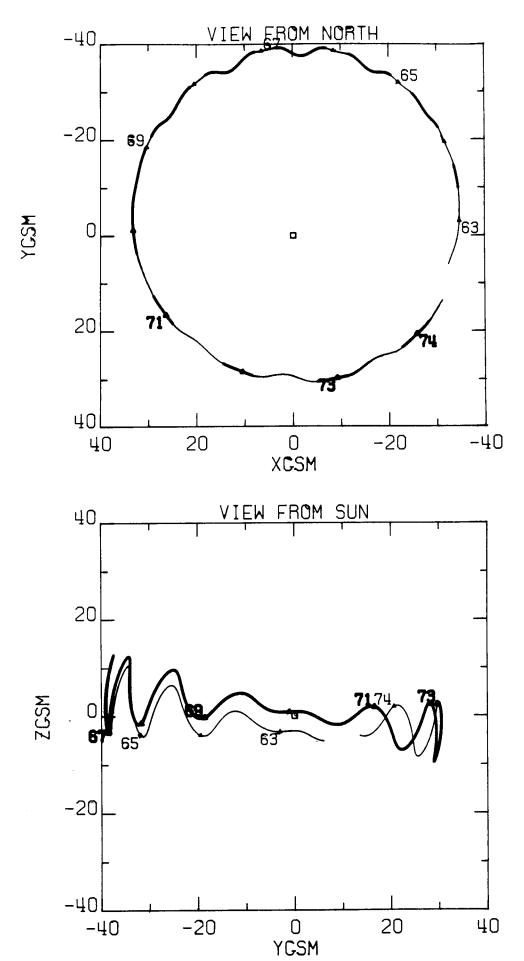
IMP 7 TRAJECTORY. ASCENDING NODE 43
FROM FEB 19 TO MAR 3 1974

DAYS 50 THRU 62

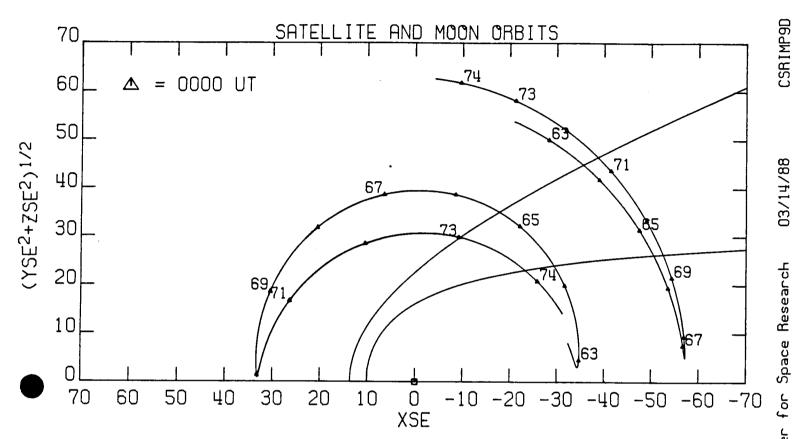


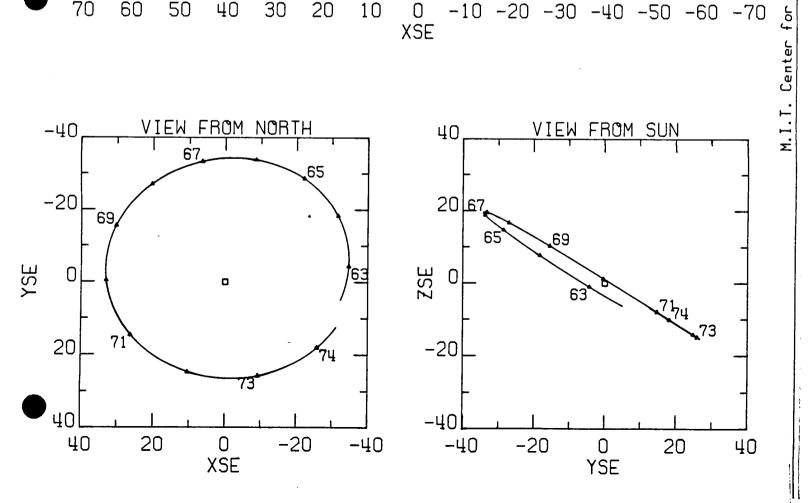


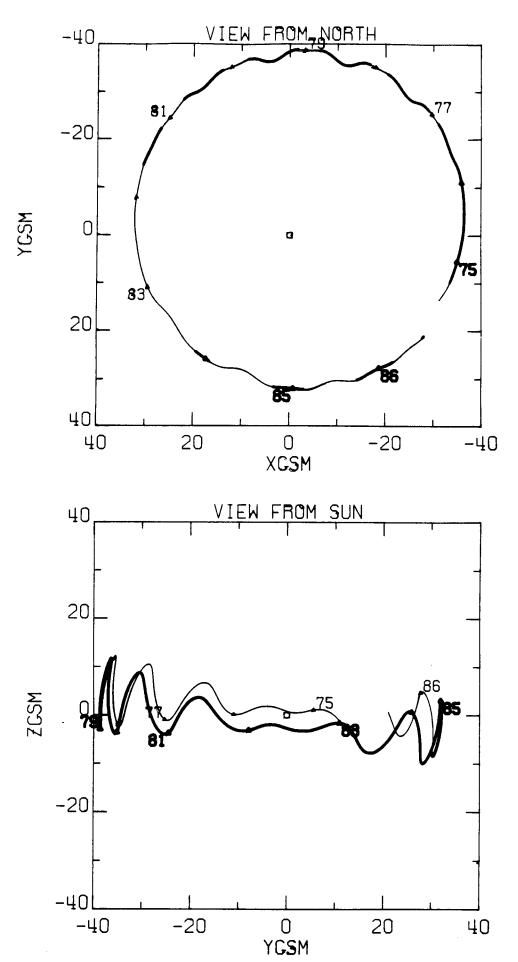
40



IMP 7 TRAJECTORY. ASCENDING NODE 44
FROM MAR 3 TO MAR 15 1974
DAYS 62 THRU 74



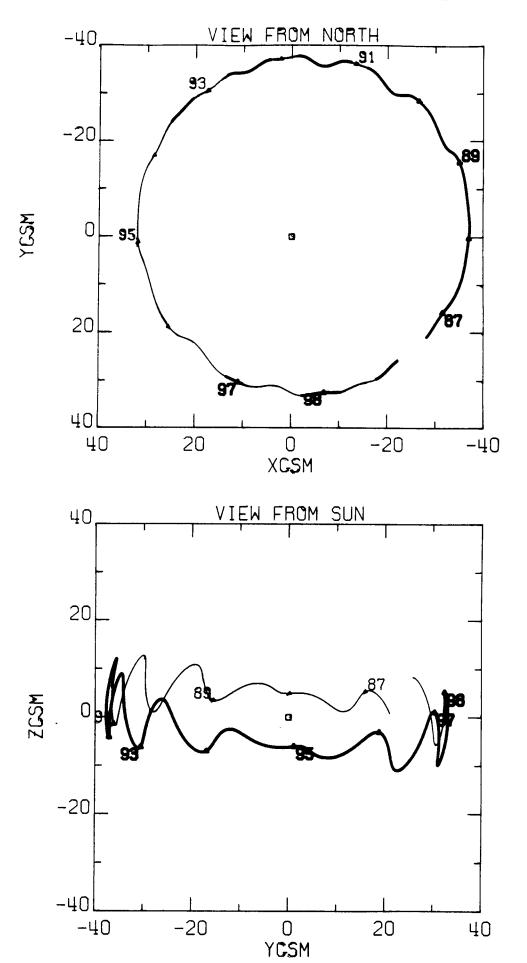




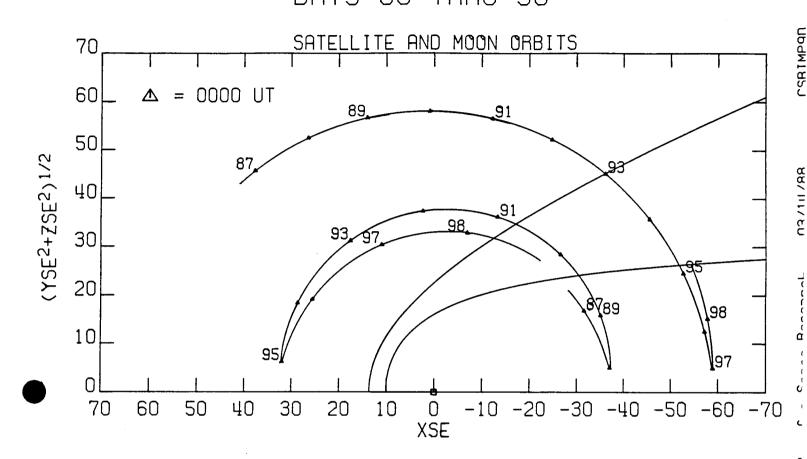
TRAJECTORY. ASCENDING NODE 45 FROM MAR 15 TO MAR 27 1974 DAYS 74 THRU CSRIMP9D AND MOON ORBITS 70 *7*5 0000 UT 60 50 79 03/14/88 40 79 85 30 .86 81<sup>8</sup>E 81 M.I.T. Center for Space Research 20 10 83 75 40 30 Ö XSE 70 60 50 -30 20 10 -40 -50 -60 -10 -20 VIEW FROM NORTH VIEW FROM SUN -40 40 81 -20 77 20 **ZSE** 0 0 0 83 20 -20 86 85 40 -40 40 20 0 XSE -20 -20 O YSE -40 -40 20 40

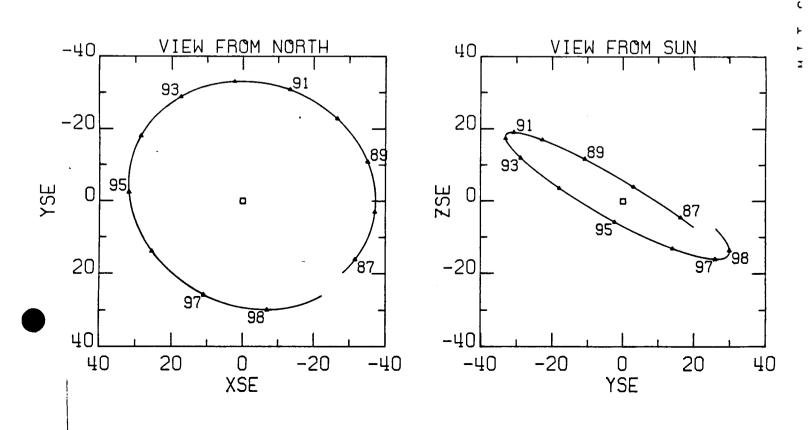
(YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup>

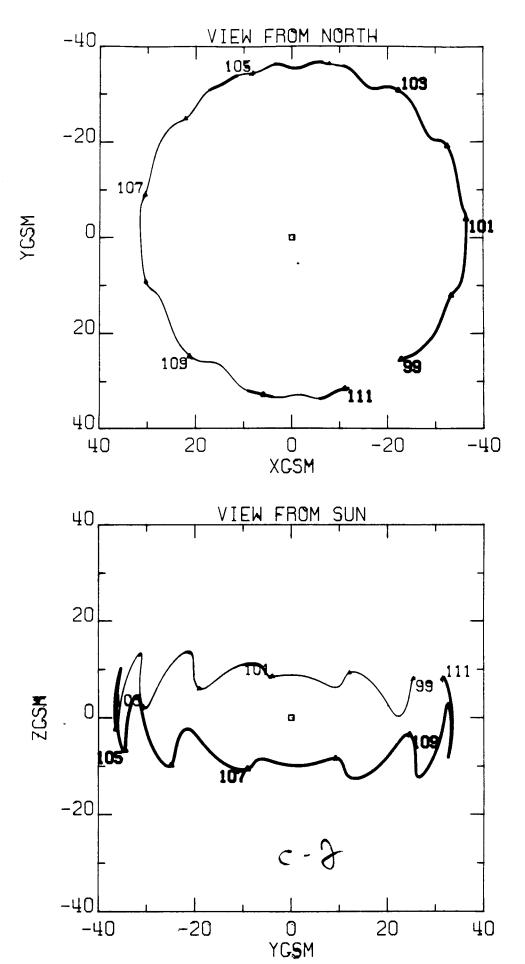
YSE



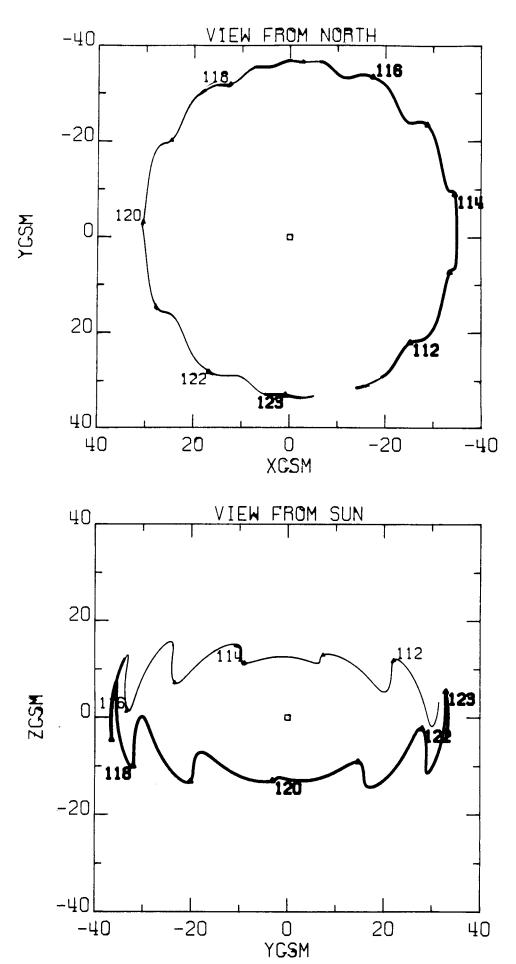
IMP 7 TRAJECTORY. ASCENDING NODE 46
FROM MAR 27 TO APR 8 1974
DAYS 86 THRU 98



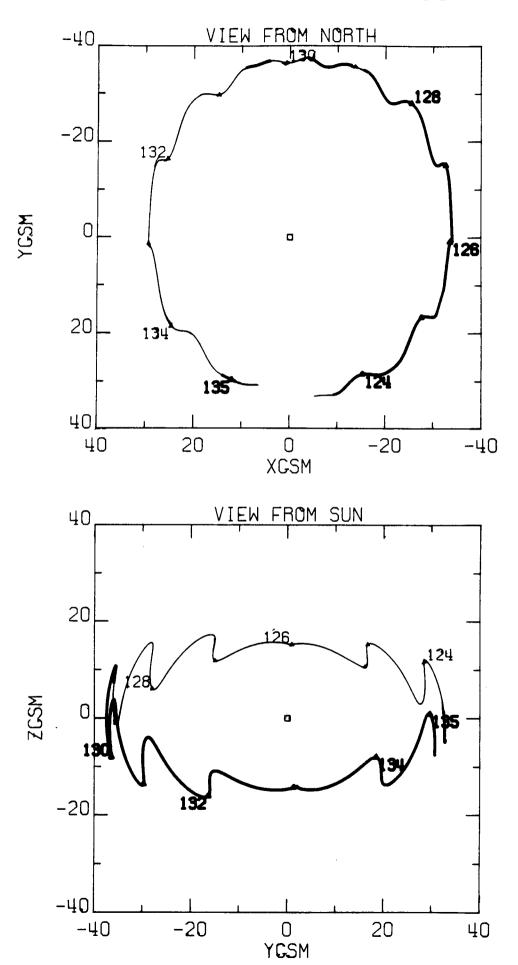




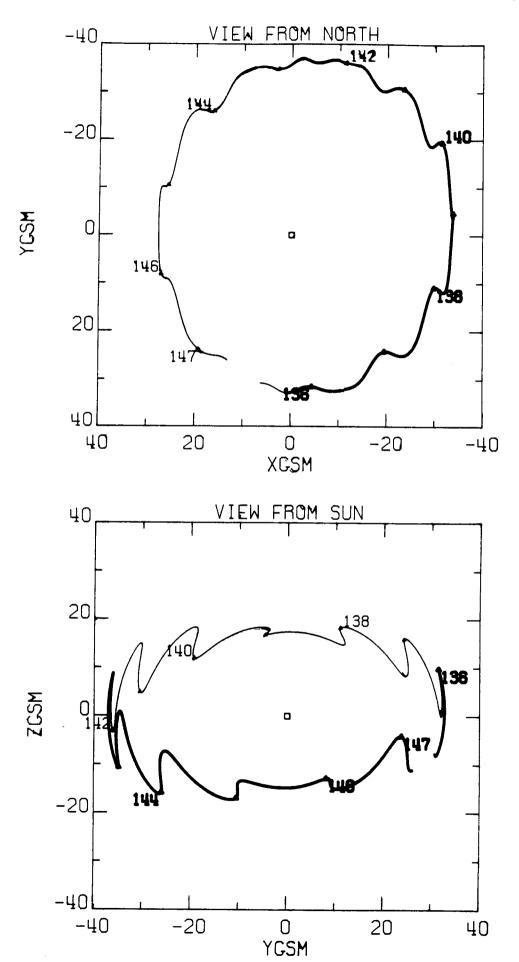
7 TRAJECTORY. ASCENDING NODE 47 FROM APR 8 TO APR 21 1974 DAYS 98 THRU **CSRIMP9**D <u>ITE AND MOON ORBITS</u> 70 105 0000 UT 60 103 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup> 03/14/88 109 40 105 30 103 99 M.I.T. Fonter for Space Research 20 111 107 10 **\**101 50 Ō XSE 70 60 40 30 20 10 -20 -30 -10-40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 105 103 -20 20 103 107 05( 101 YSE **ZSE** 0 0 1b1 99 107 **1**111 20 -20 109 109 99 111 40 -40 0 40 20 -40 -20 -40 O YSE -20 20 40 **XSE** 



7 TRAJECTORY. IMP ASCENDING NODE 48 TO MAY FROM APR 21 DAYS THRU CSR1MP9D MOON ORBITS 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup> 03/14/88 M.I.T. Center for Space Research -50 -30 -60 -10-20 **XSE** VIEW FROM NORTH -40-20 \_120 YSE ZSE -20 XSE -20 O YSE -20 -40 -40

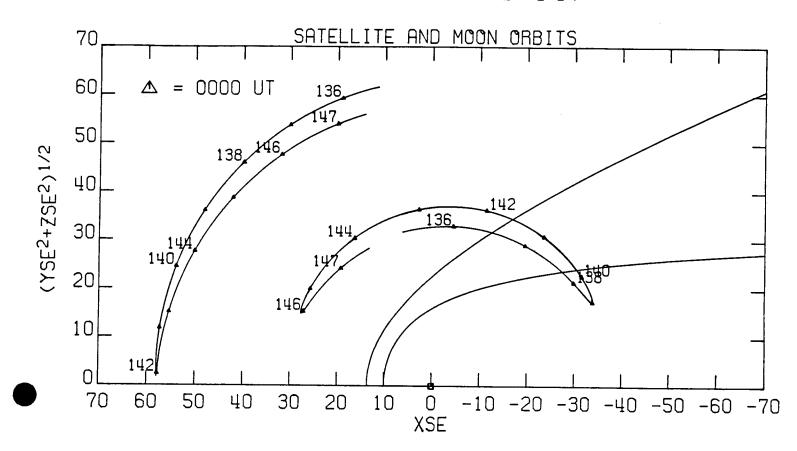


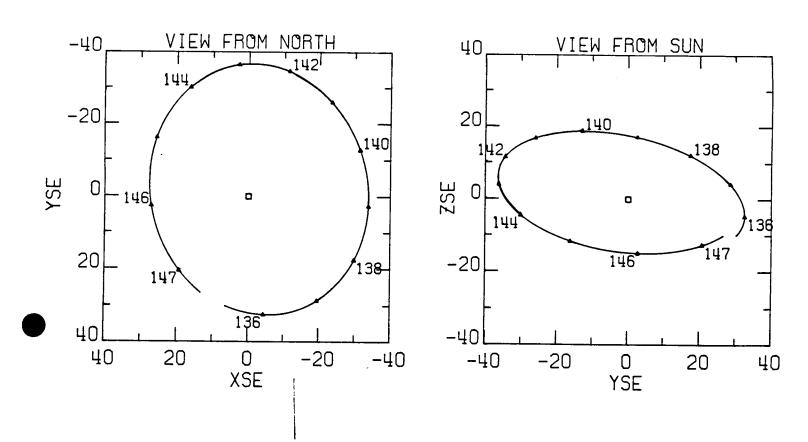
IMP 7 TRAJECTORY. ASCENDING NODE 49 FROM MAY 3 TO MAY DAYS 123 THRU SATELLITE AND MOON ORBITS CSRIMPan = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 03/14/88 Ĩ24 M.I.T. Center for Space Research **∆**126 -30 -10 -20 -50 -40 -60 XSE VIEW FROM NORTH -40 VIEW FROM SUN -20 YSE **ZSE** -20 -40 XSE -20 -40 YSE -40 -20 

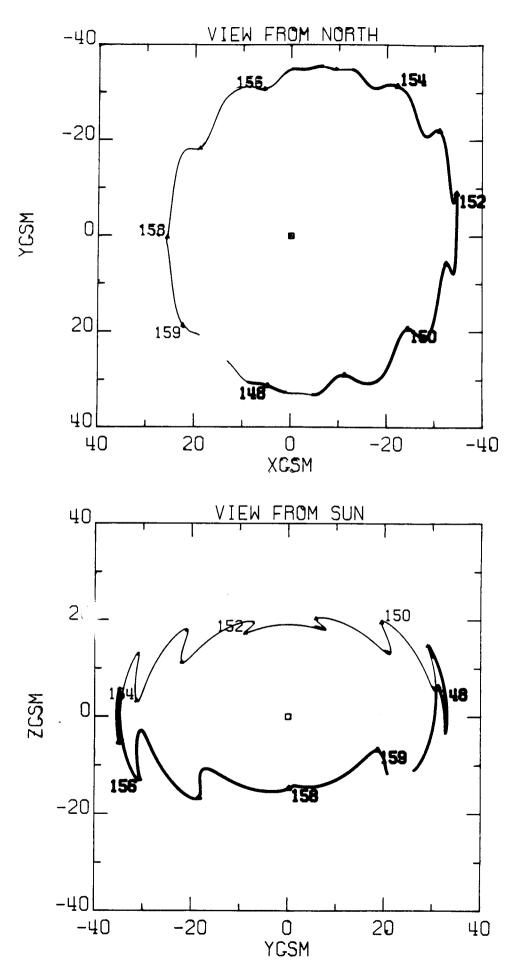


IMP 7 TRAJECTORY. ASCENDING NODE 50

FROM MAY 15 TO MAY 27 1974 DAYS 135 THRU 147



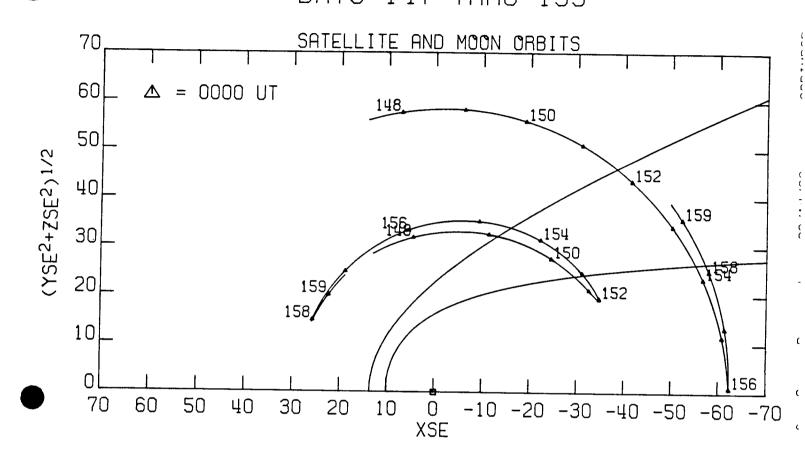


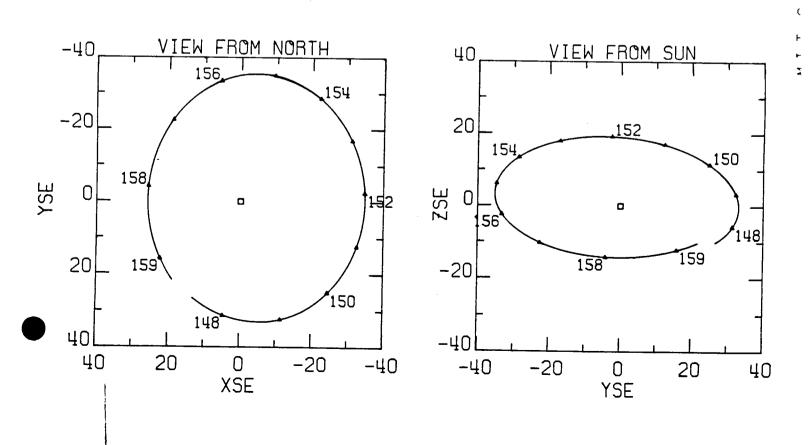


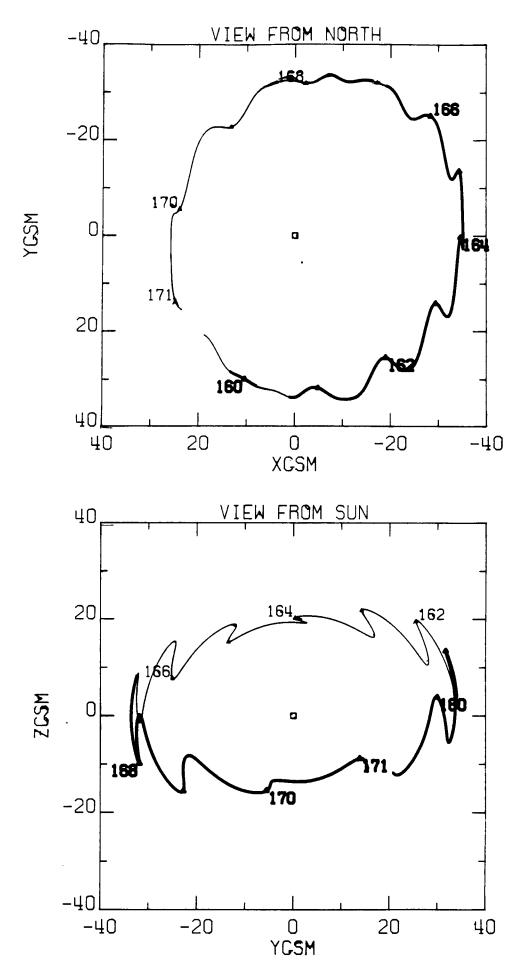
IMP 7 TRAJECTORY. ASCENDING NODE 51

FROM MAY 27 TO JUN 8 1974

DAYS 147 THRU 159



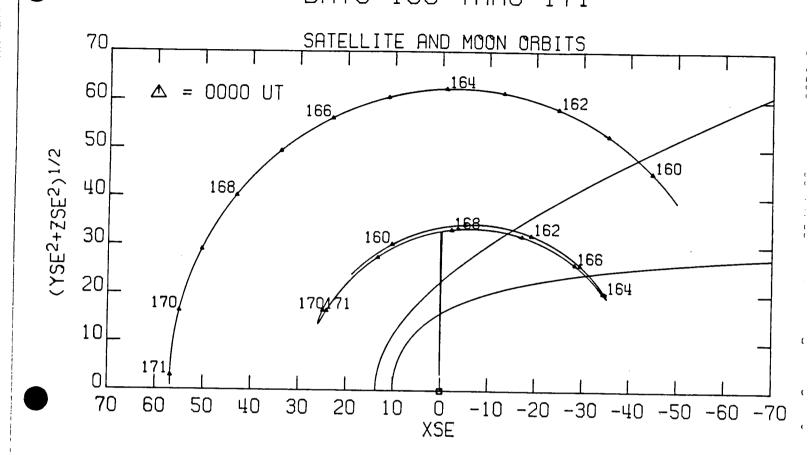


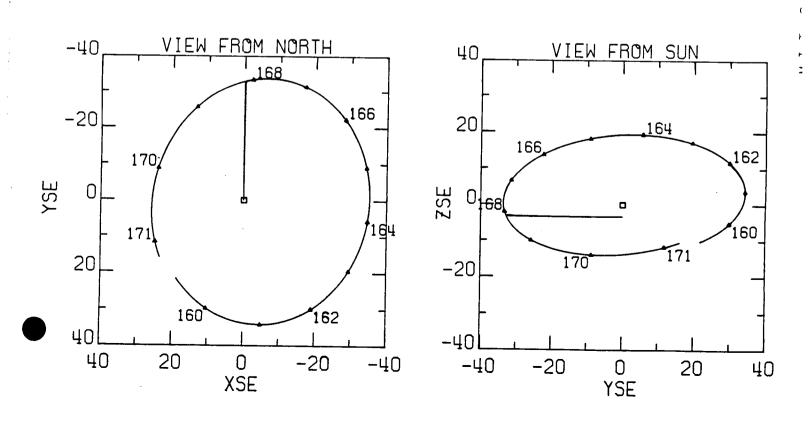


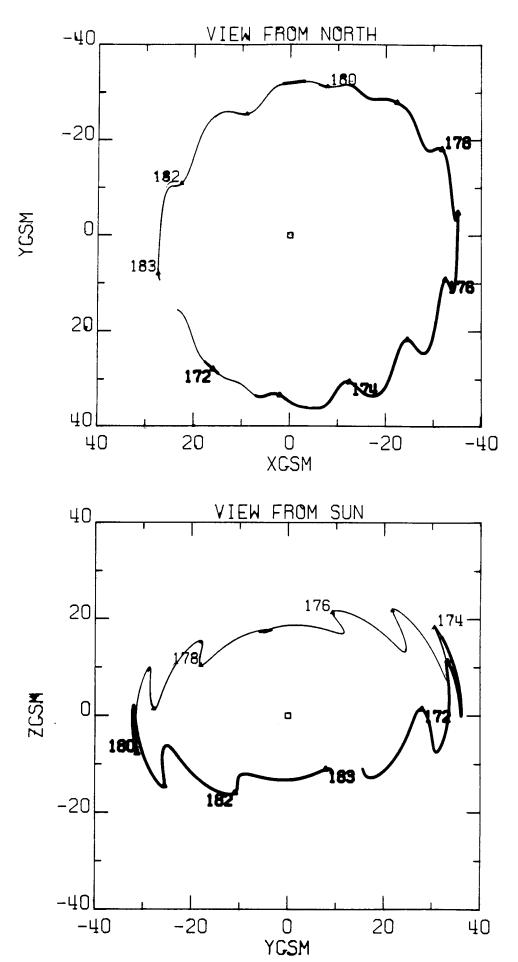
IMP 7 TRAJECTORY. ASCENDING NODE 52

FROM JUN 8 TO JUN 20 1974

DAYS 159 THRU 171

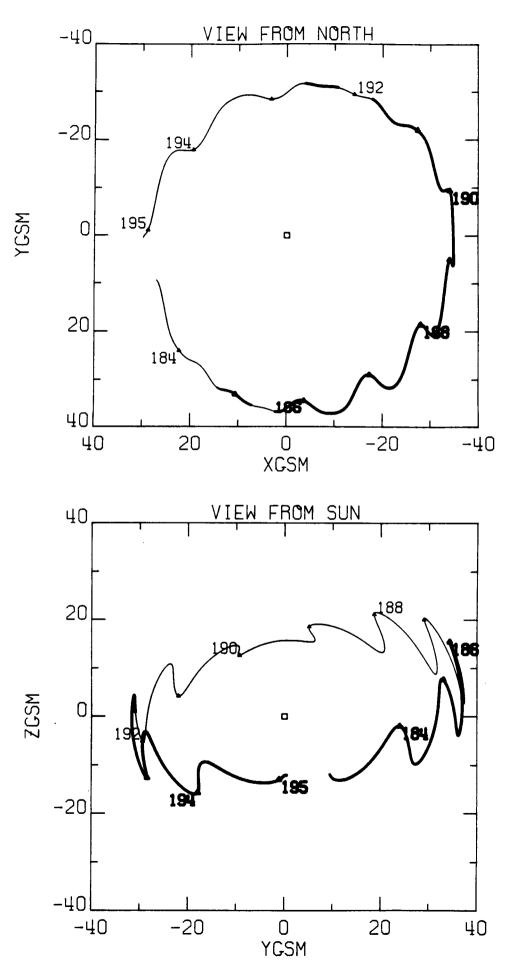




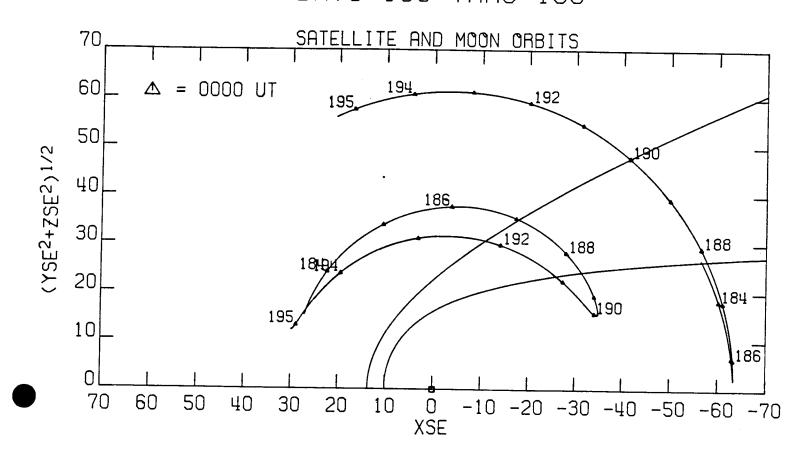


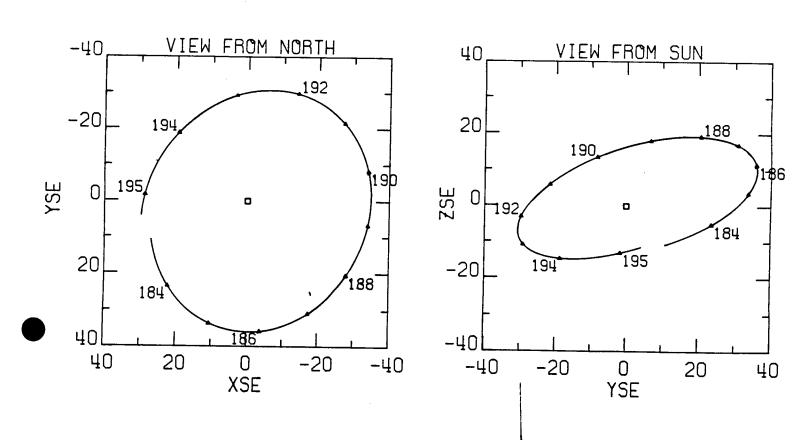
(YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup>

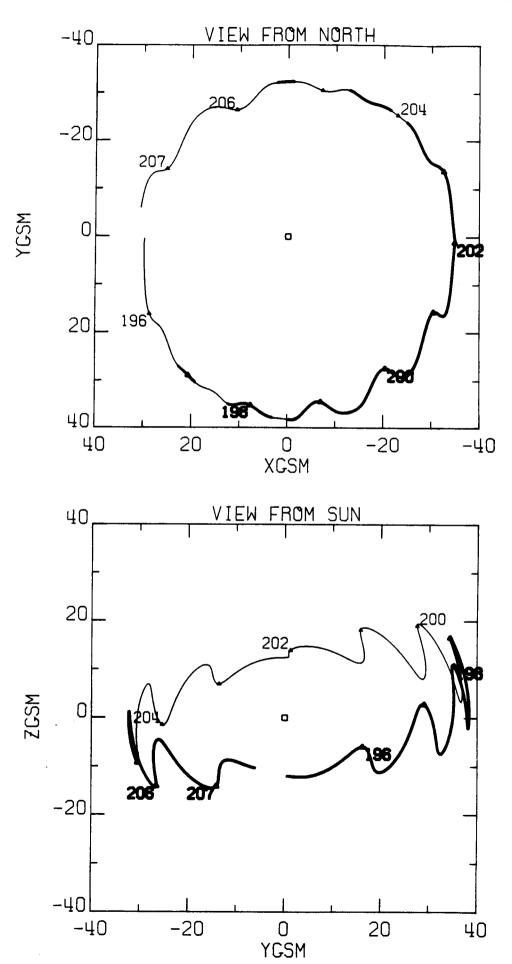
-40 -20 YSE ZSE -20 -40 XSE -20 YSE -20 -40 -40 



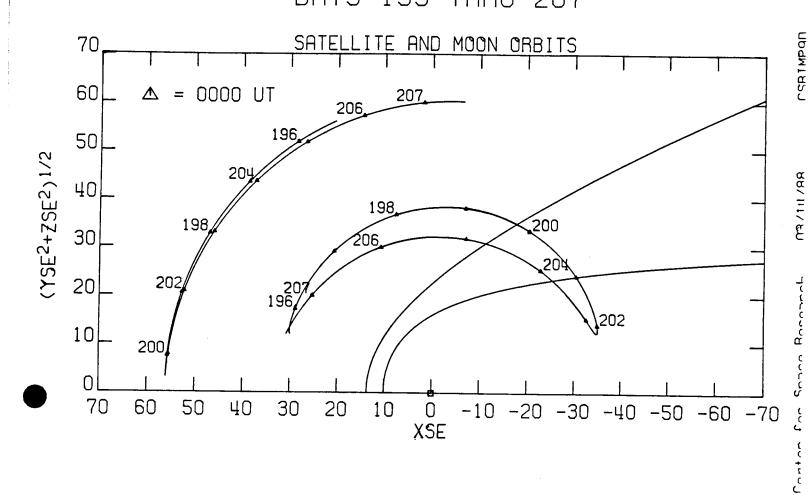
IMP 7 TRAJECTORY. ASCENDING NODE 54
FROM JUL 2 TO JUL 14 1974
DAYS 183 THRU 195

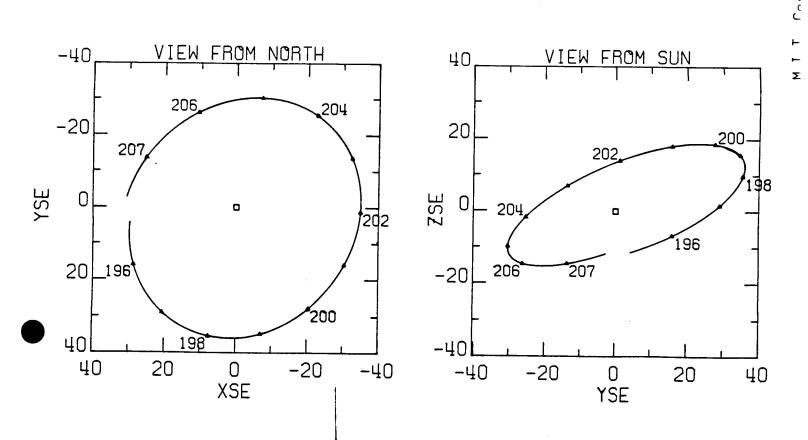




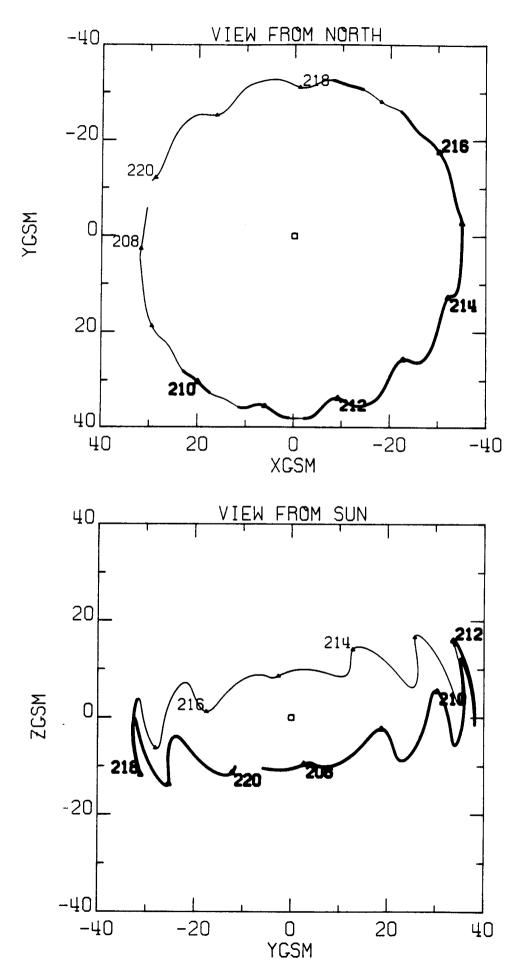


IMP 7 TRAJECTORY. ASCENDING NODE 55
FROM JUL 14 TO JUL 26 1974
DAYS 195 THRU 207

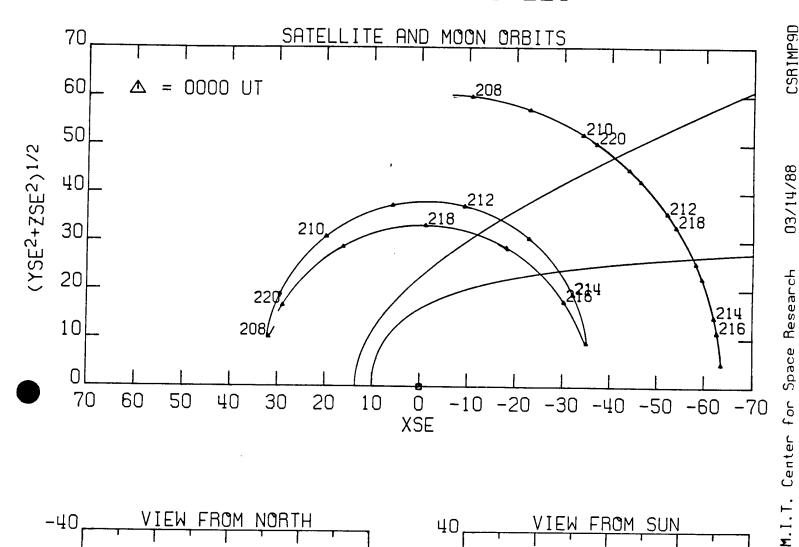


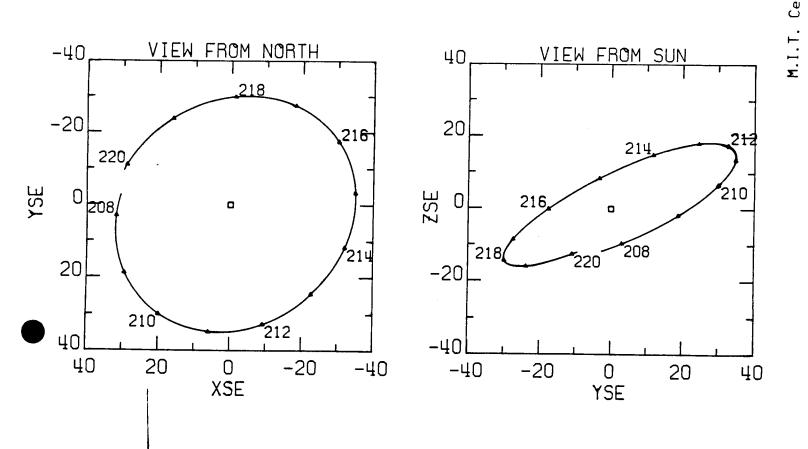


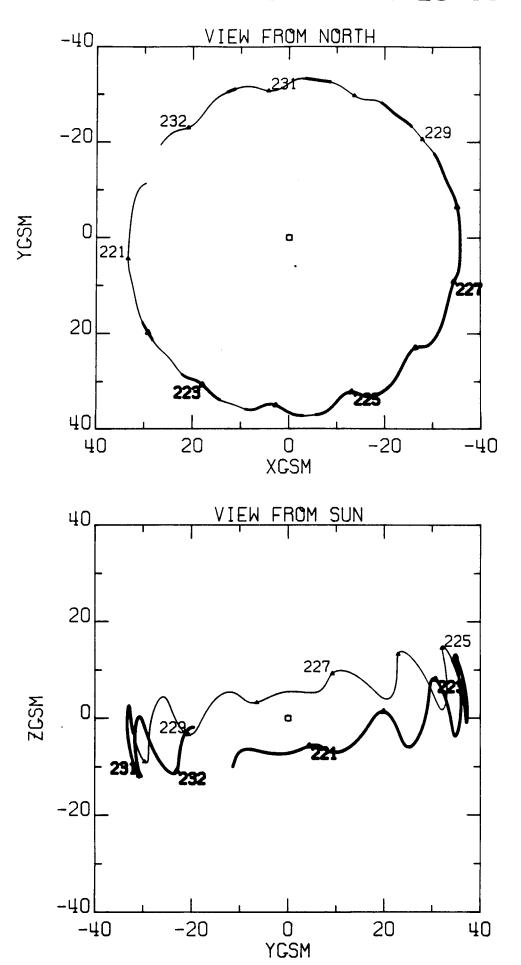
IMP 7 FROM JUL 26 TO AUG 8 1974



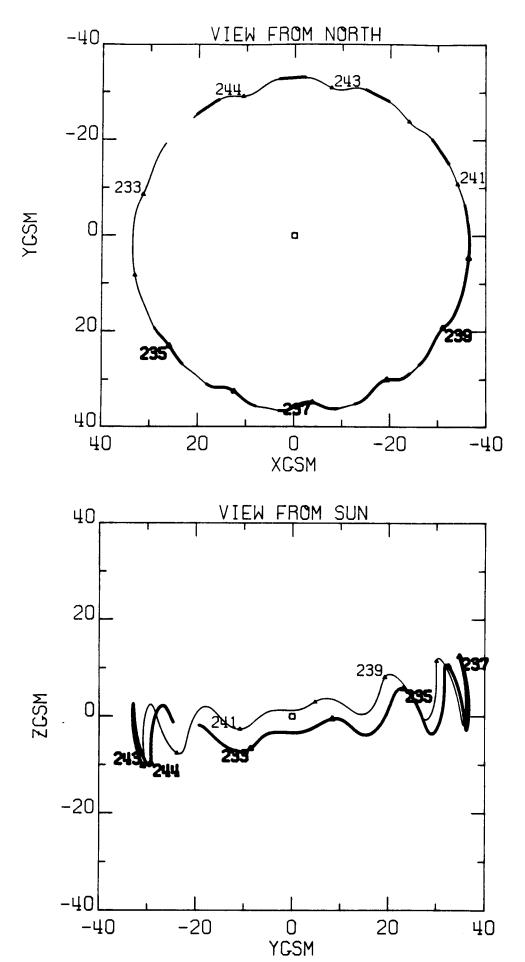
FROM JUL 26 TO AUG 8 1974 DAYS 207 THRU 220



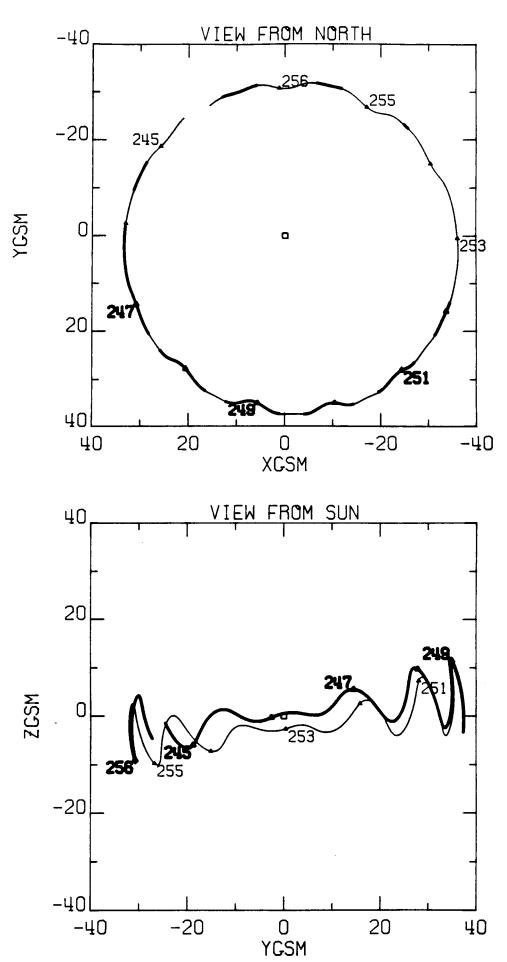




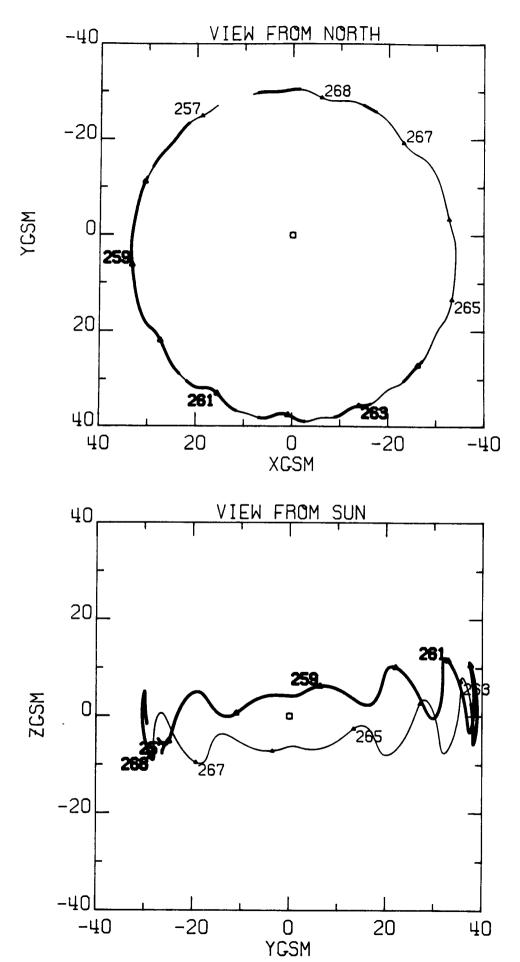
IMP 7 TRAJECTORY. ASCENDING NODE 57 FROM AUG 8 TO AUG 20 DAYS 220 THRU 232 SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 -10 -20 -30 -40 -50 -60 XSE VIEW FROM NORTH -40 VIEW FROM SUN -20 YSE **ZSE** -20 -40 -20 O YSE -40 -40 -20 XSE



7 TRAJECTORY. ASCENDING NODE 58 FROM AUG 20 TO SEP DAYS 232 THRU 244 SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+2SE<sup>2</sup>)<sup>1/2</sup> XSE -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 YSE ZSE 24: -20 23<del>9</del> -40 -40 -20 -40 -20 YSE XSE

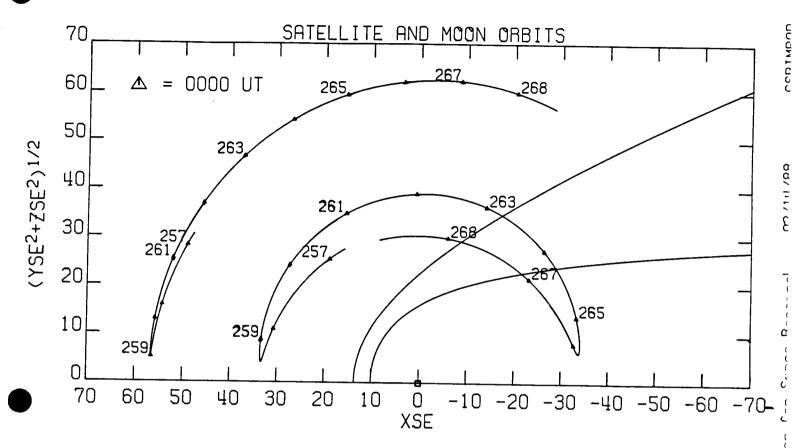


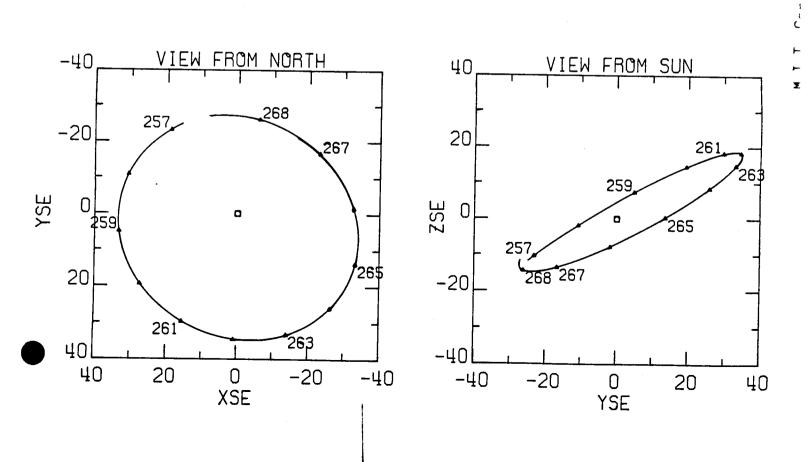
7 TRAJECTORY. ASCENDING NODE 59 FROM SEP 1 TO SEP DAYS 244 THRU 256 SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 255,251 XSE -10 -20 -30 -40 -50 -60 -70<sup>-</sup> -40 VIEW FROM NORTH VIEW FROM SUN <u>25</u>6 -20 245, YSE ZSE -20 -40 XSE -20 -40 -40 -20 O YSE 

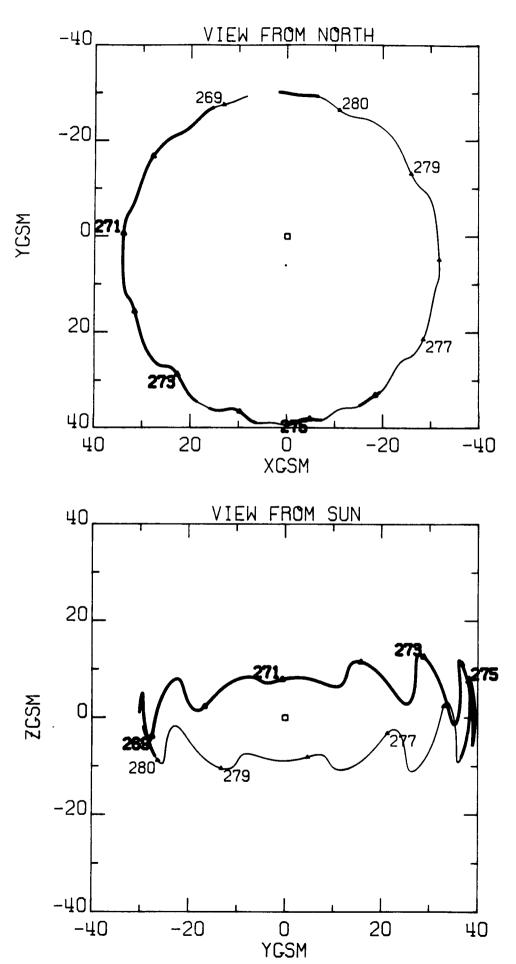


IMP / IMHJECTORY. ASCENDING NODE 60

FROM SEP 13 TO SEP 25 1974 DAYS 256 THRU 268



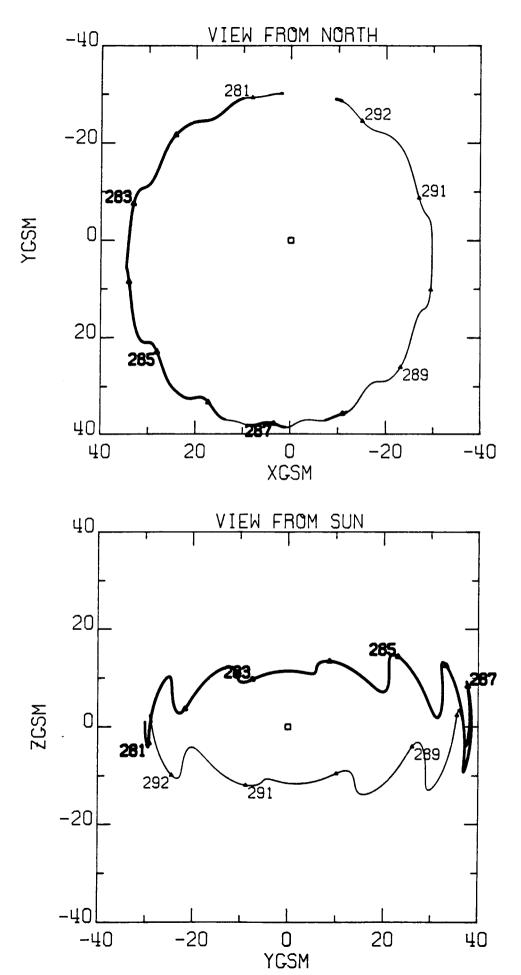




IMP 7 TRAJECTORY. ASCENDING NODE 61 FROM SEP 25 TO OCT DAYS 268 THRU 280 SATELLITE AND MOON ORBITS CSRIMPON = 0000 UT 280 269 m3/14/88 M.I.T. Center for Snace Research -10 -20 -30 -50 -60 -40 XSE VIEW FROM NORTH -40 VIEW FROM SUN -20 o<sup>471</sup> **ZSE** -20 -40 XSE -20 -40 YSE -40 -20 

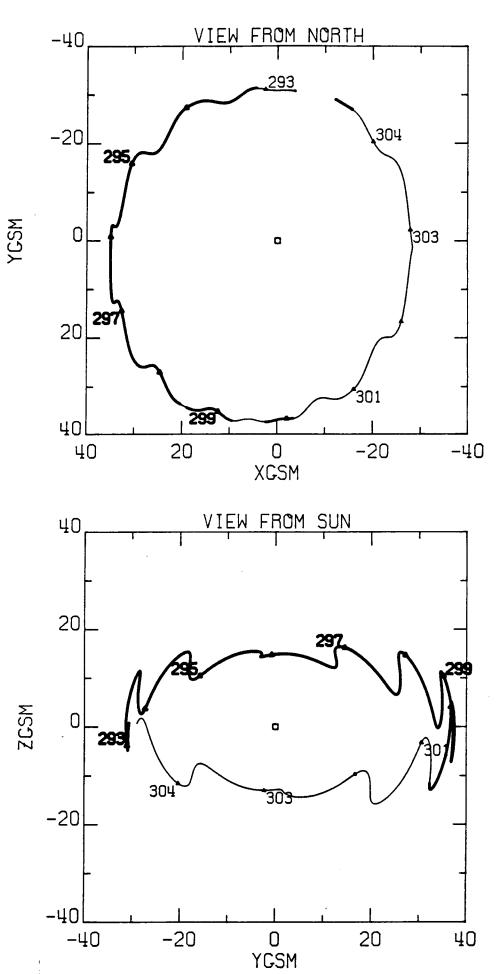
(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2

YSE



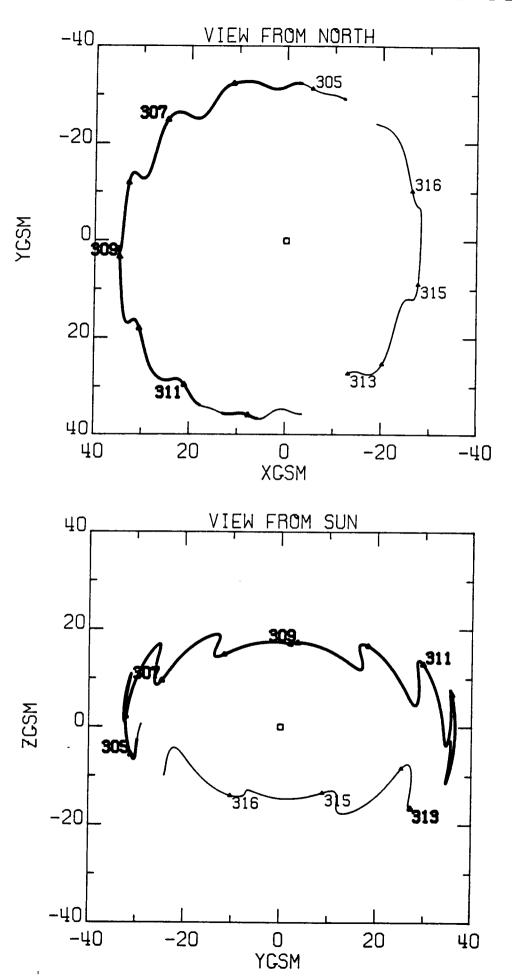
7 TRAJECTORY. ASCENDING NODE 62 FROM OCT TO OCT DAYS 280 THRU 292 SATELLITE AND MOON ORBITS CSR I MP9D 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 03/14/88 M.I.T. Center for Space Research XSE -10 -20 -30 -40 -50 -60 -40 VIEW FROM NORTH VIEW FROM SUN -20 ZSE -20 XSE -20 -40 YSE -40 -20 

YSE



M.I.T. Center for Space Research 03/14/88

IMP 7 TRAJECTORY. ASCENDING NODE 63 FROM OCT 19 TO OCT 31 DAYS 292 THRU 304 70 SATELLITE AND MOON ORBITS 297 295 0000 UT 60 299 50 293 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 M3/111/FM 40 299 301 30 <u> 29</u>3 301 20 **/**303 10 70 60 50 0 XSE 40 10 -30 30 20 -10 -20 -40 -50 M.I.T Fonton VIEW FROM NORTH -40 VIEW FROM SUN 40 <u> 2</u>93 -20 20 304 <del>2</del>95 297 299 295 YSE 0 **ZSE** 0 0 303 30<del>1</del> 7293 297 20 303 304 -20 301 299 40 -40 40 20 0 XSE -20 0 YSE -40 -40 -20 20 40



CCRIMPO

03/11/88

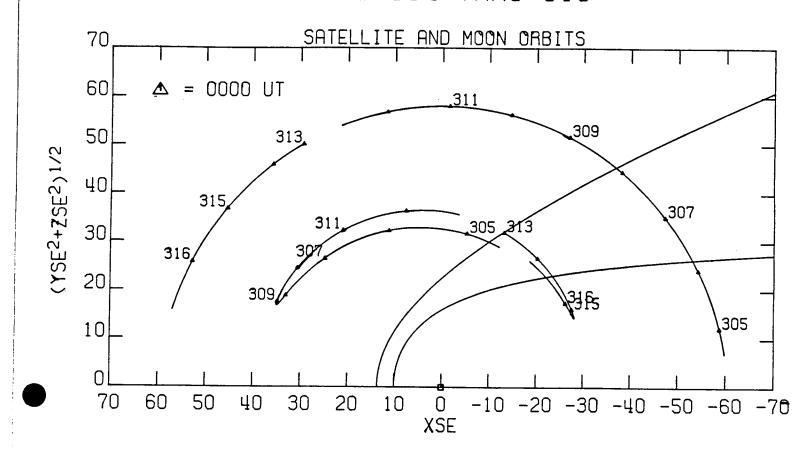
20 JOS

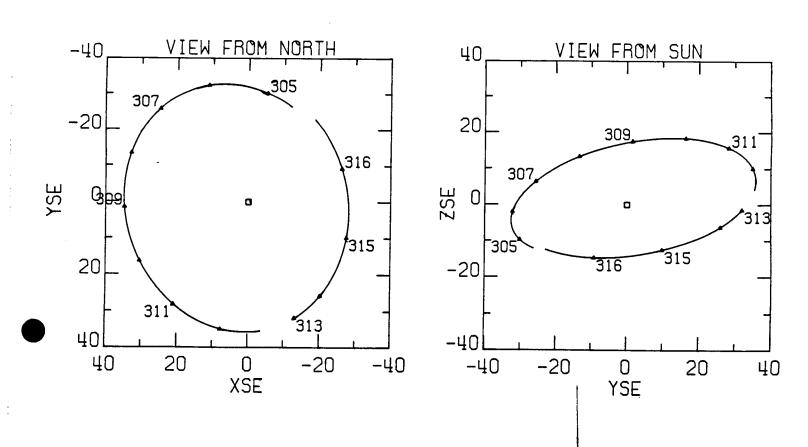
Coool one

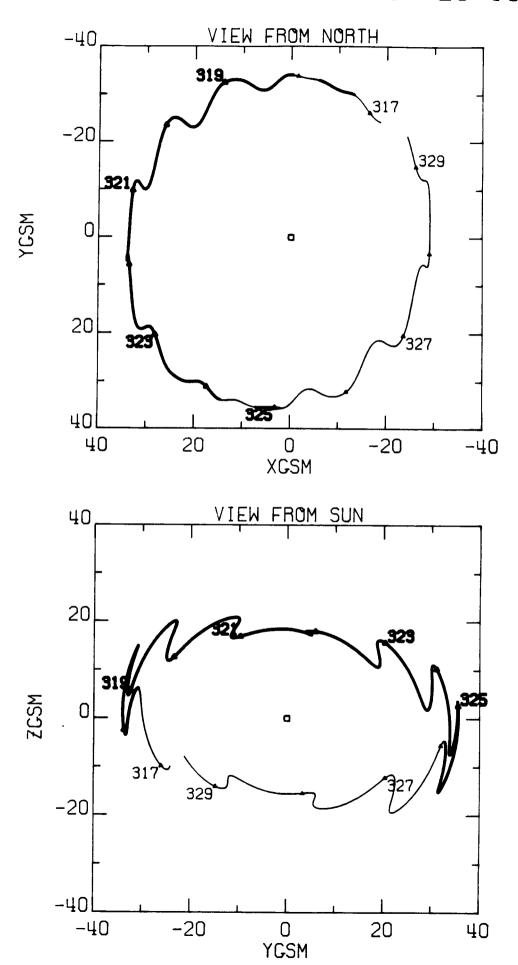
10 KON 10+

Lenter

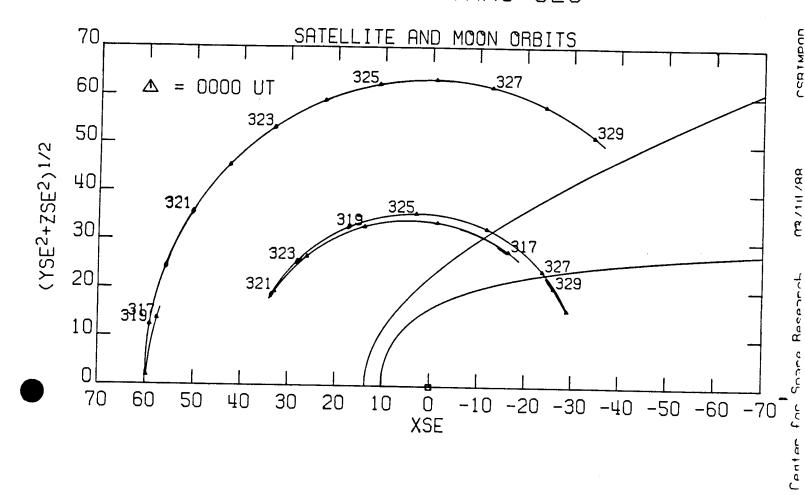
FROM OCT 31 TO NOV 12 1974
DAYS 304 THRU 316

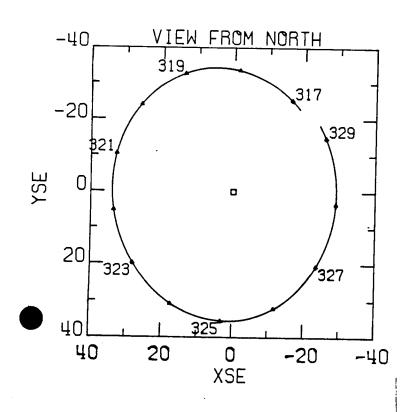


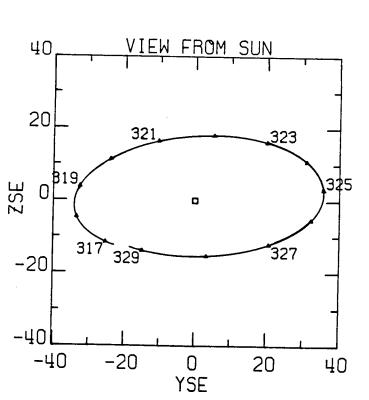


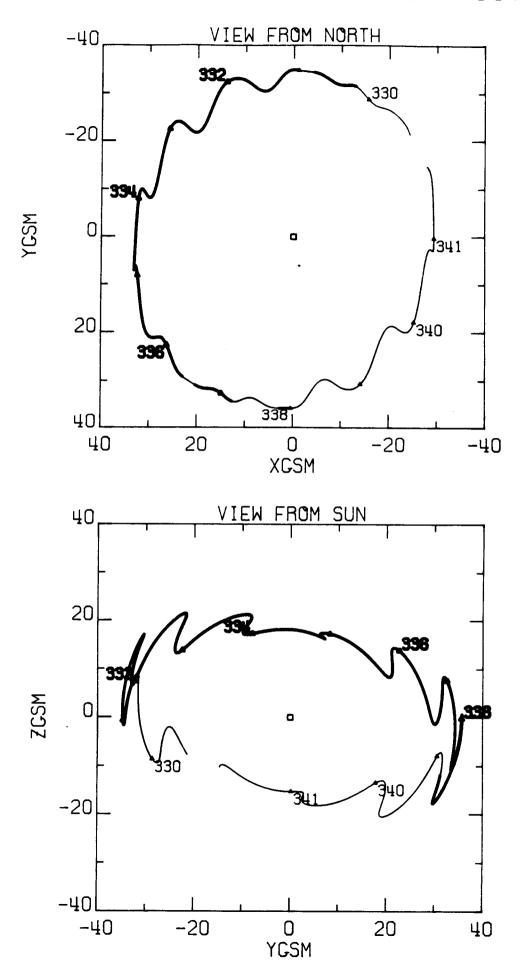


FROM NOV 12 TO NOV 25 1974 DAYS 316 THRU 329

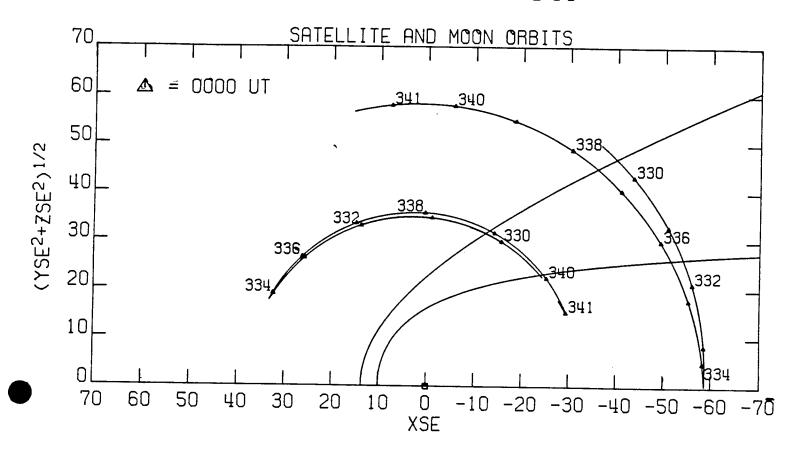


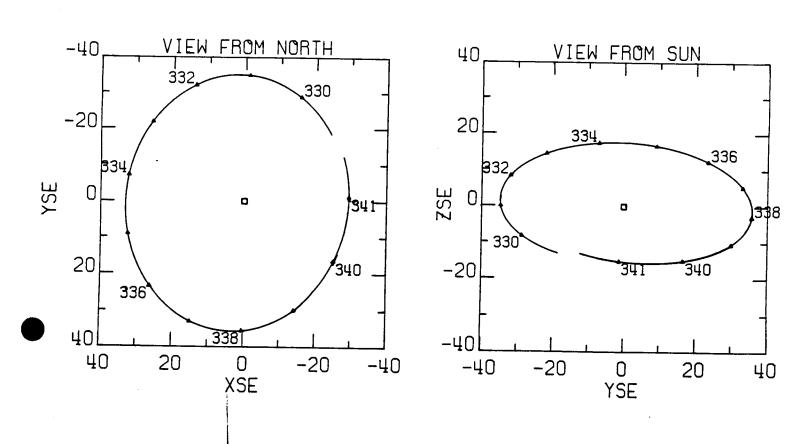


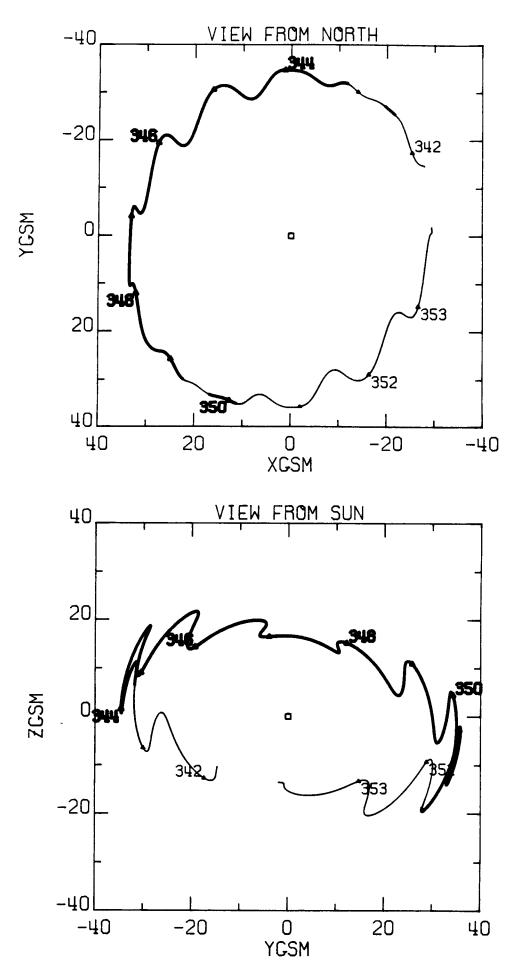




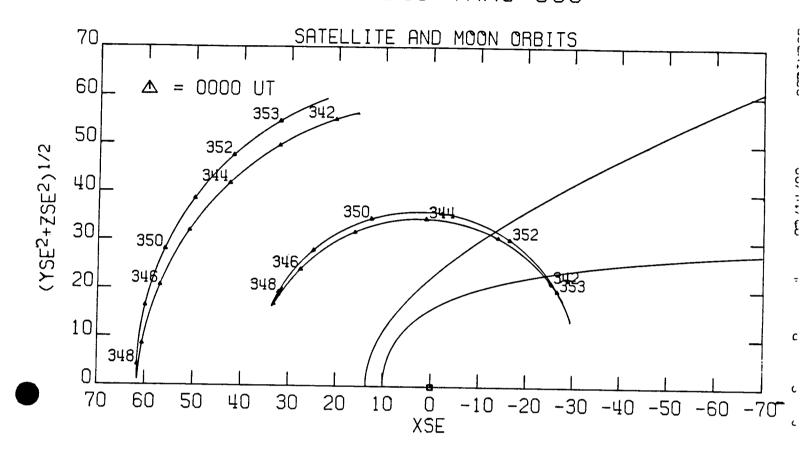
FROM NOV 25 TO DEC 7 1974 DAYS 329 THRU 341

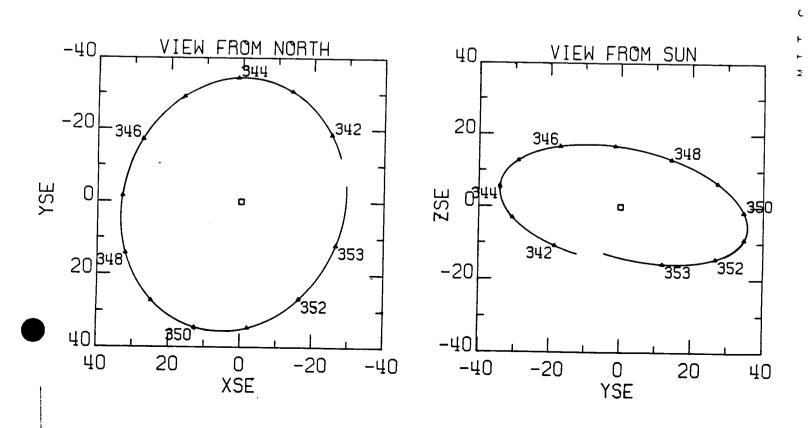


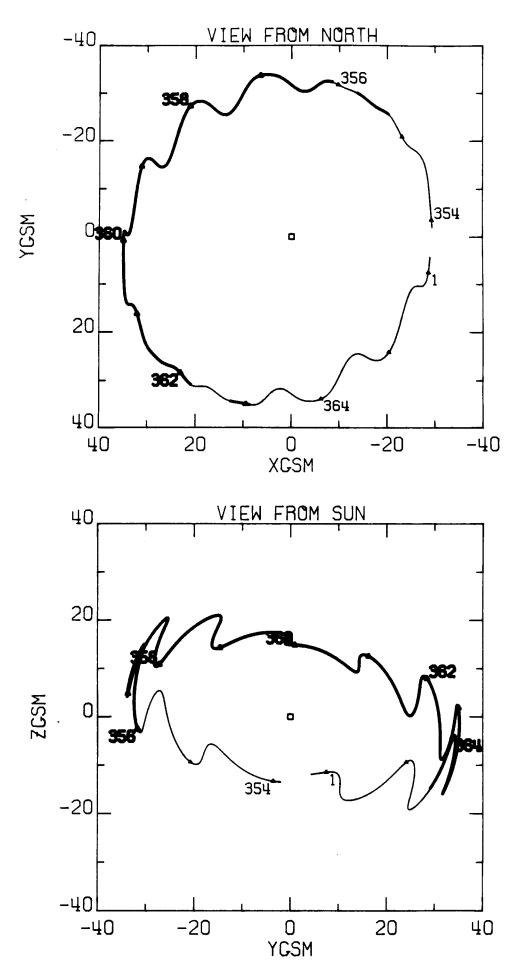




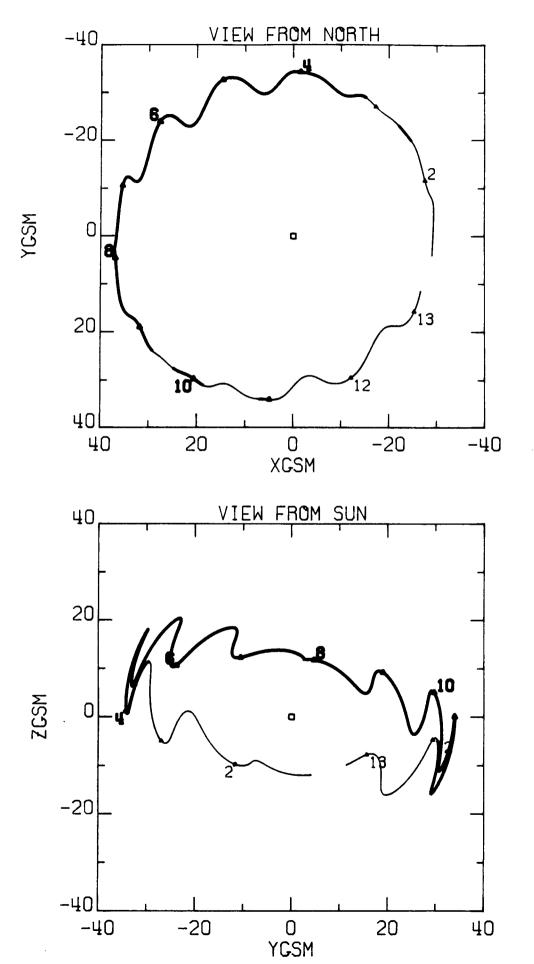
FROM DEC 7 TO DEC 19 1974 DAYS 341 THRU 353



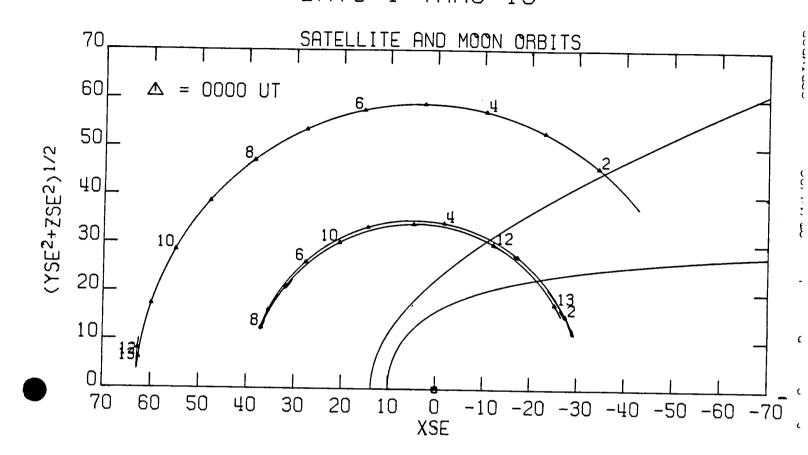


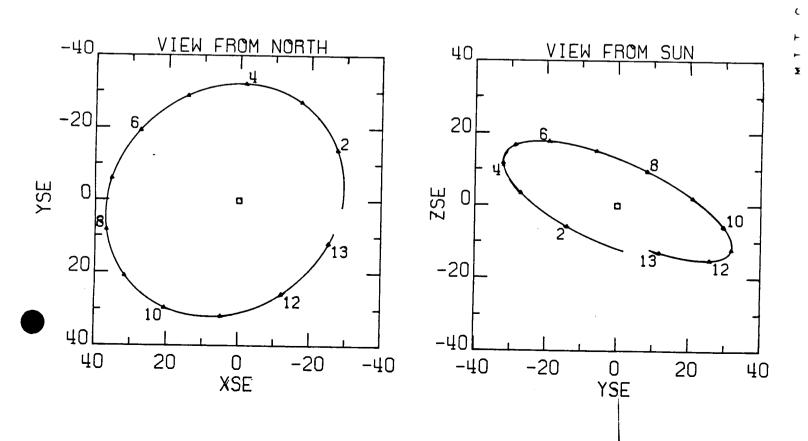


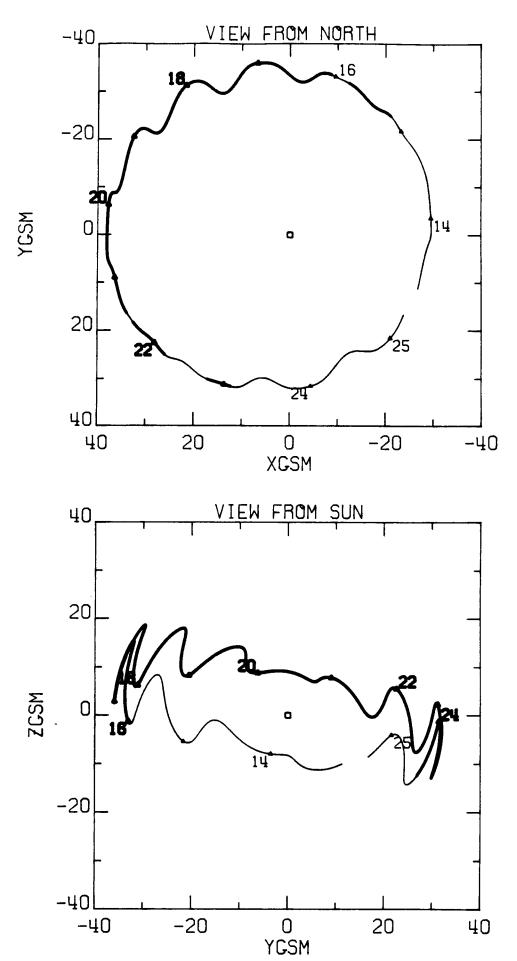
IMP 7 TRAJECTORY. ASCENDING NODE 68 FROM DEC 19 TO JAN DAYS 353 THRU 70 MOON ORBITS AND 356 60 0000 UT 354, 358 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 40 360 .36<u>4</u> 35€ 30 20 360, 362 **1**354 **364** 10 70 60 50 40 0 XSE 30 20 10 -30 -10 -20 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 356 358 -20 20 358 360 354 YSE **ZSE** 360 0 356 362 0 0 354 20 364 -20 362 364 40 -40 40 20 0 -20 O YSE -40 -40 -20 20 40 **XSE** 



IMP 7 TRAJECTORY. ASCENDING NODE 69
FROM JAN 1 TO JAN 13 1975
DAYS 1 THRU 13







IMP 7 TRAJECTORY. ASCENDING NODE 70 FROM JAN 13 TO JAN 25 1975 DAYS 13 THRU 25 70 SATELLITE AND MOON ORBITS 60 = 0000 UT 22 18, 50 (YSE<sup>2</sup>+2SE<sup>2</sup>)1/2 40 16, 25 30 20 20 10 14 70 60 50 10 Ö XSE -10 -20 -30 -40 -50 -60 -70 40 30 20 VIEW FROM NORTH -40 VIEW FROM SUN 40 16 18 -20 20 18 20 16 36 YSE 14 ZSE O 22 2\$ 20 / 25 -20 24 **2**2 24 40 -40 40

20

0

XSE

-20

-40

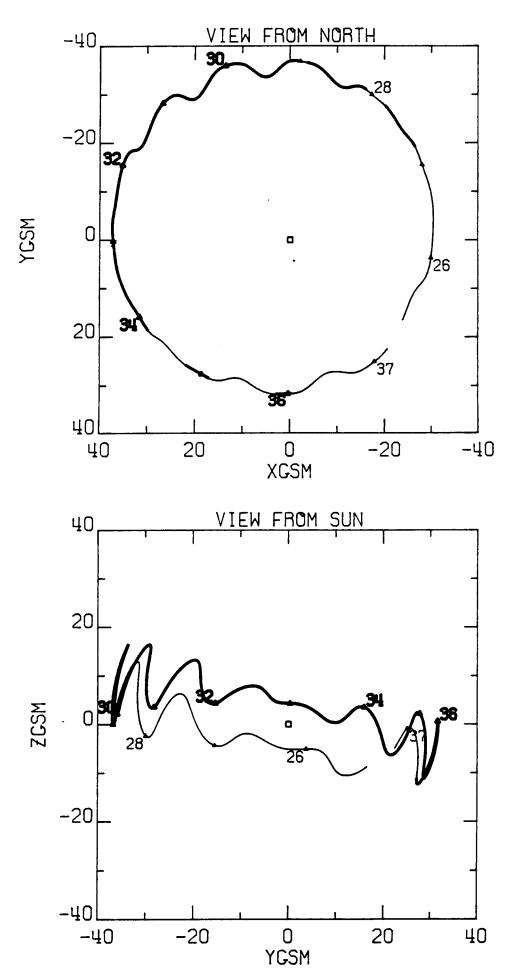
-40

-20

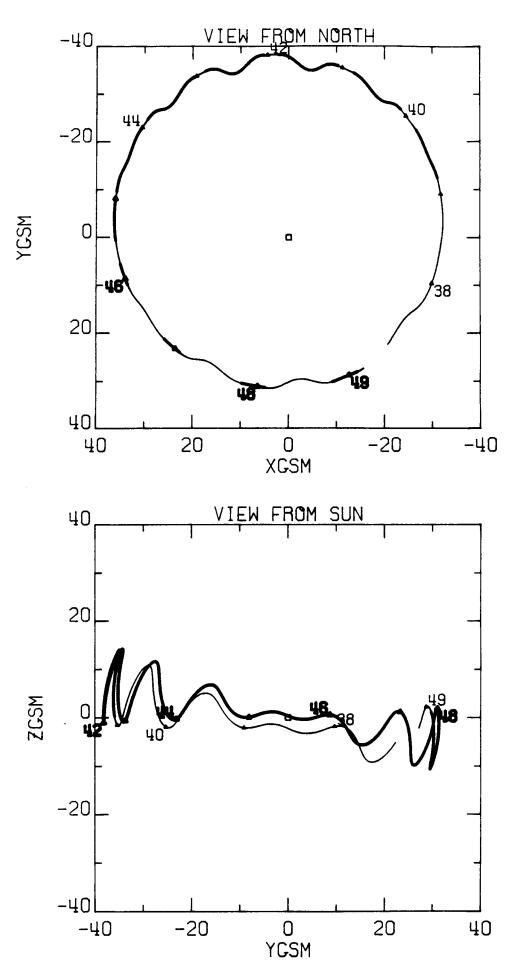
O YSE

20

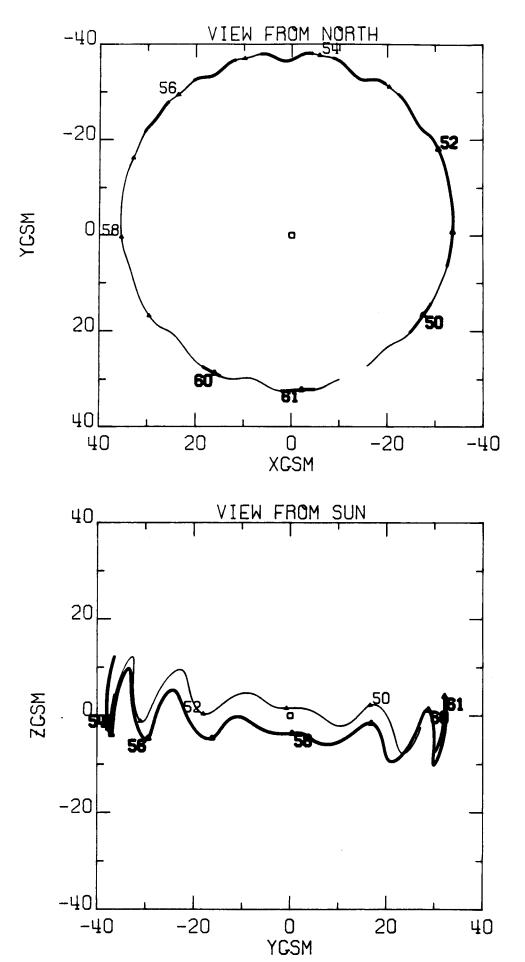
40



IMP 7 TRAJECTORY. ASCENDING NODE 71 FROM JAN 25 TO FEB 6 1975 DAYS 25 THRU 37 70 SATELLITE AND MOON ORBITS 60 = 0000 UT 36 37 50 32 (YSE<sup>2</sup>+2SE<sup>2</sup>)1/2 40 30 36 30 26 20 323 10 126 28 50 60 30 70 Ö XSE 40 20 10 -30 -10 -20 -50 -40 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 30 28 -20 20 32 YSE 0 ZSE O a 26 20 34 -20 36 40 -40 40 20 0 -20 O YSE -40 -40 -20 20 40 XSE.



IMP 7 TRAJECTORY. ASCENDING NODE 72 FROM FEB 6 TO FEB 18 1975 DAYS 37 THRU 49 SATELLITE AND MOON ORBITS 70 0000 UT 60 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 40 30 48 49 40 20 10 42 70 60 50 40 30 10 0 XSE 20 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 40 VIEW FROM SUN 40 -20 20 YSE 0 ZSE 38 20 -20 49 48 40 -40 40 20 0 -20 -40 -40 -20 O YSE 20 40 XSE



IMP 7 TRAJECTORY. ASCENDING NODE 73

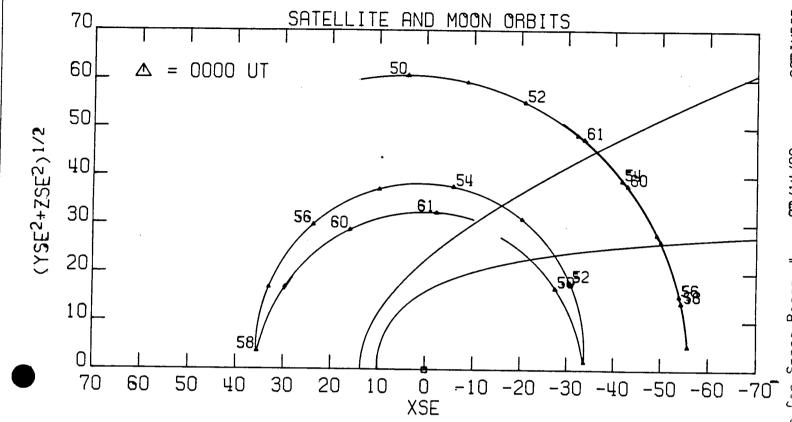
FROM FEB 18 TO MAR 2 1975

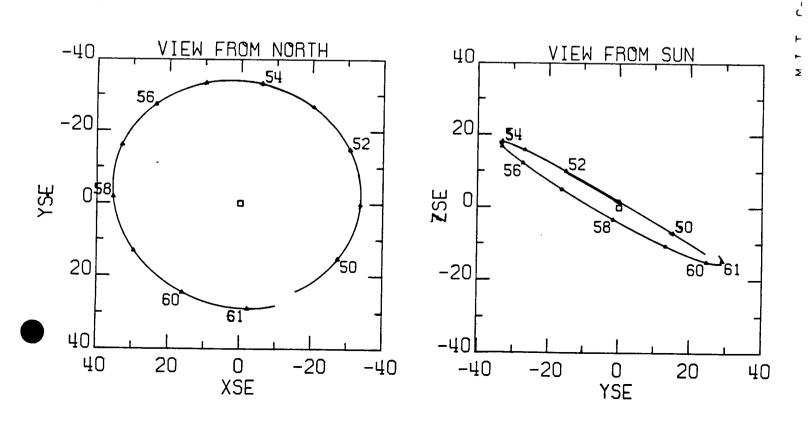
DAYS 49 THRU 61

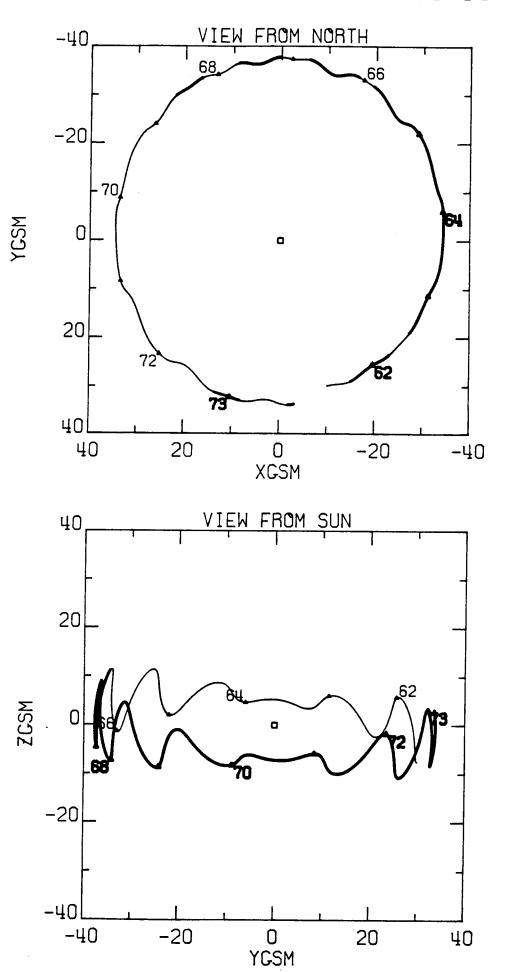
SATELLITE AND MOON ORBITS

A = 0000 UT

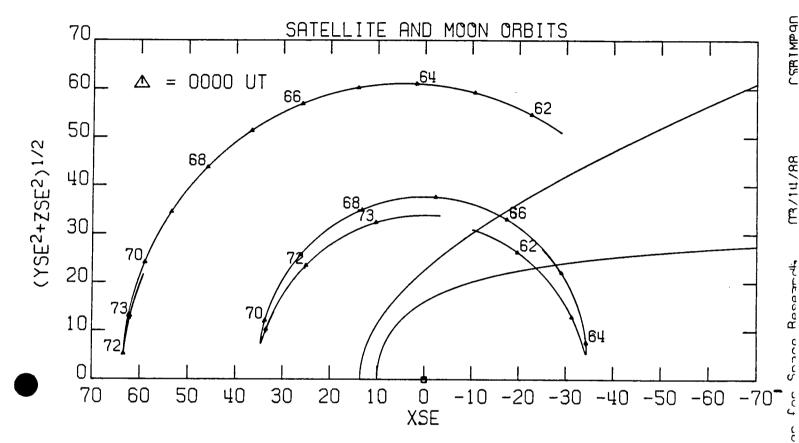
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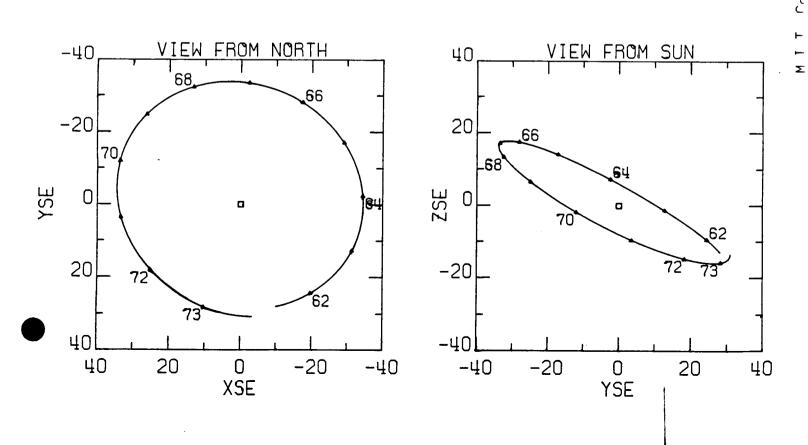




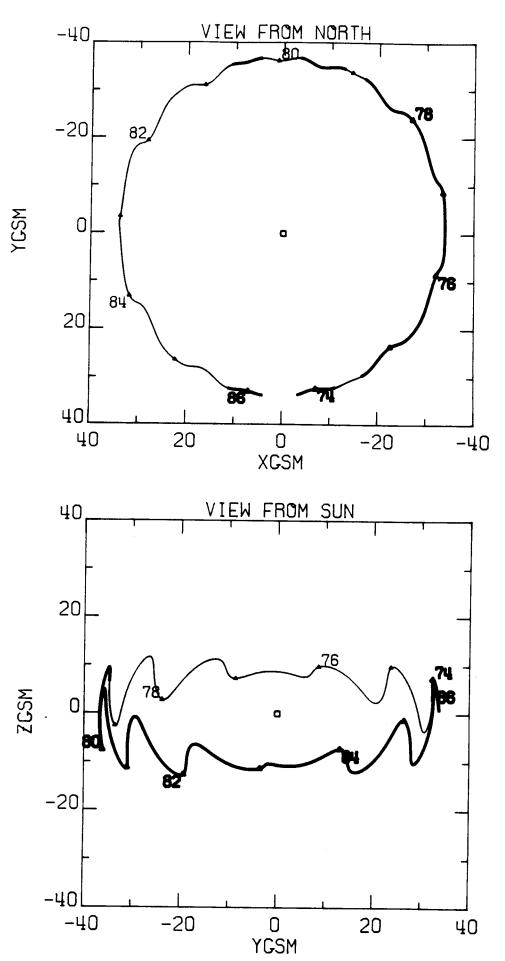


IMP 7 TRAJECTORY. ASCENDING NODE 74
FROM MAR 2 TO MAR 14 1975
DAYS 61 THRU 73

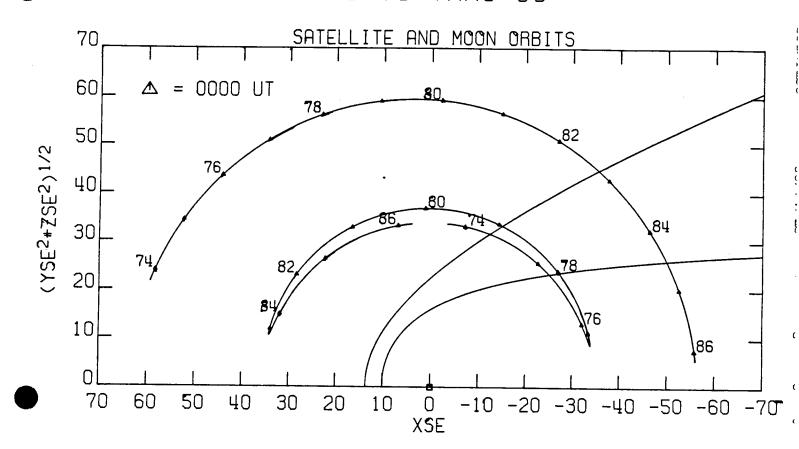


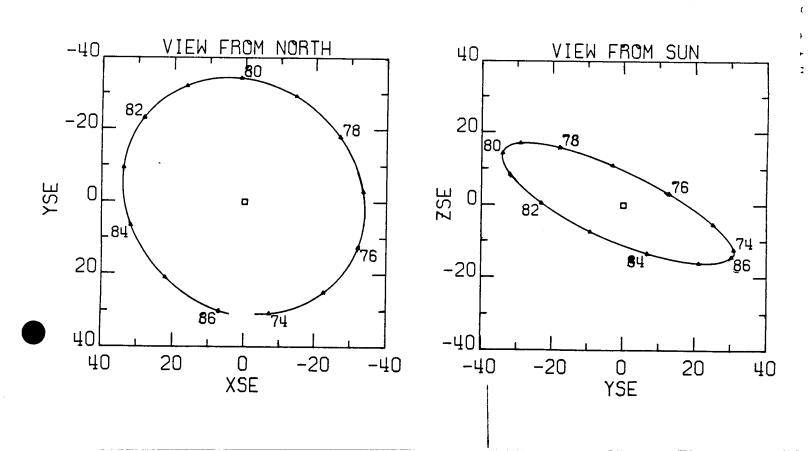


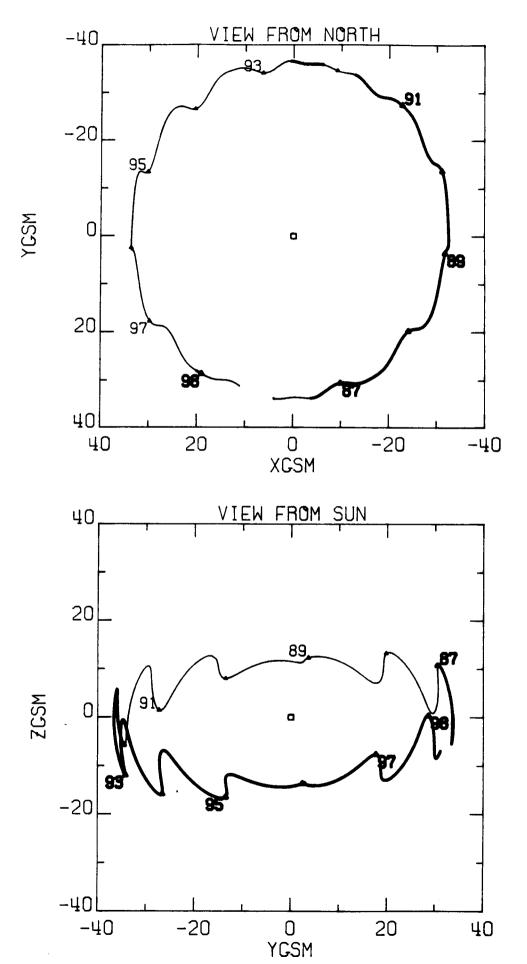
IMP 7 FROM MAR 14 TO MAR 27 1975



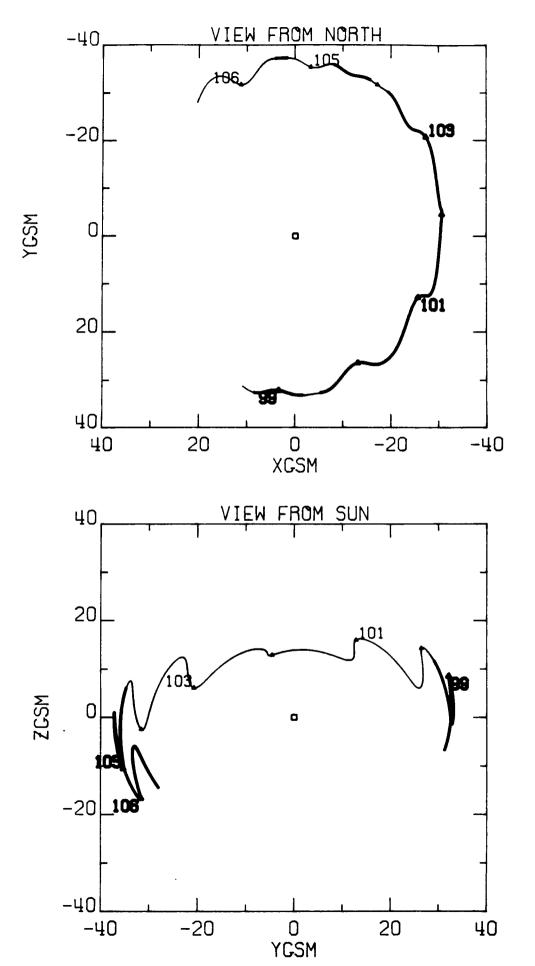
FROM MAR 14 TO MAR 27 1975 DAYS 73 THRU 86



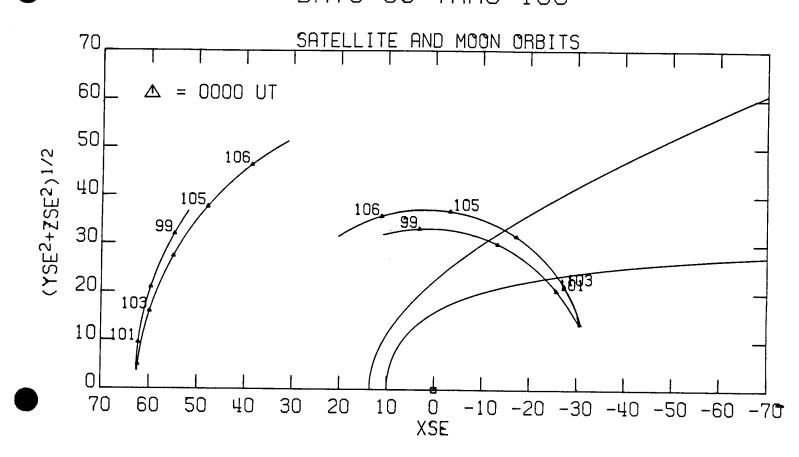


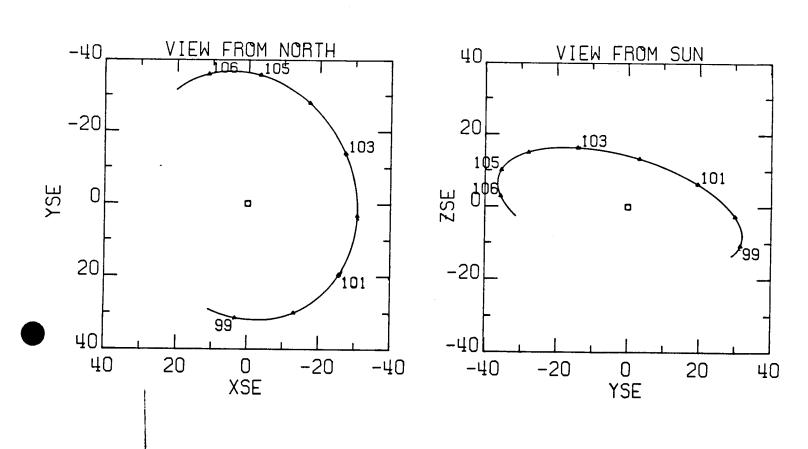


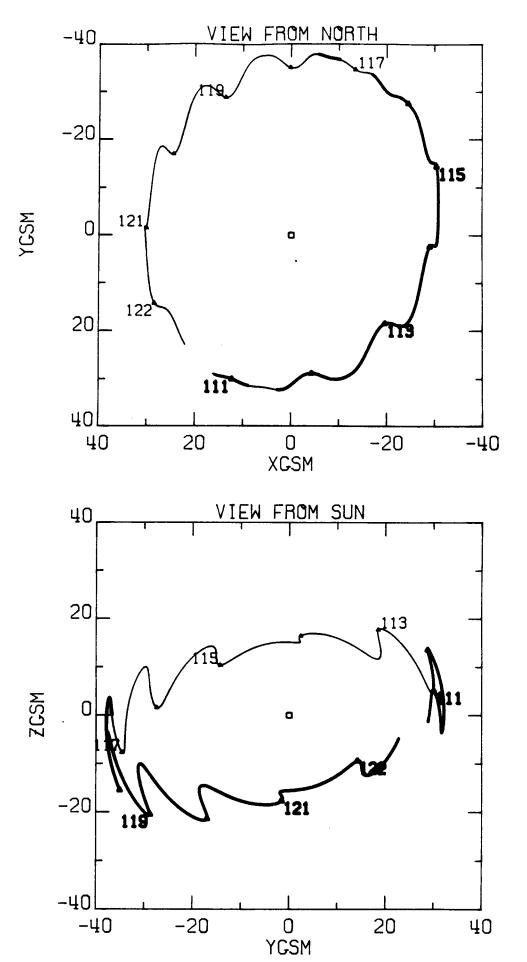
IMP 7 TRAJECTORY. ASCENDING NODE 76 FROM MAR 27 TO APR 8 1975 DAYS 86 THRU 98 SATELLITE AND MOON ORBITS 70 93 = 0000 UT 60 91 50 97 (YSE<sup>2</sup>+2SE<sup>2</sup>)1/2 RR/111/87 98 40 93 89 30 91 20 10 87 70 60 50 40 30 Ö XSE 20 -30 10 -10 -40 -50 -20 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 91 -20 95 20 91 89 YSE 0 ZSE 0 95 97 **8**9 87 20 -20 98 97 98 87 40 -40 40 20 0 -20 -40 -40 -20 O YSE 20 40 XSE



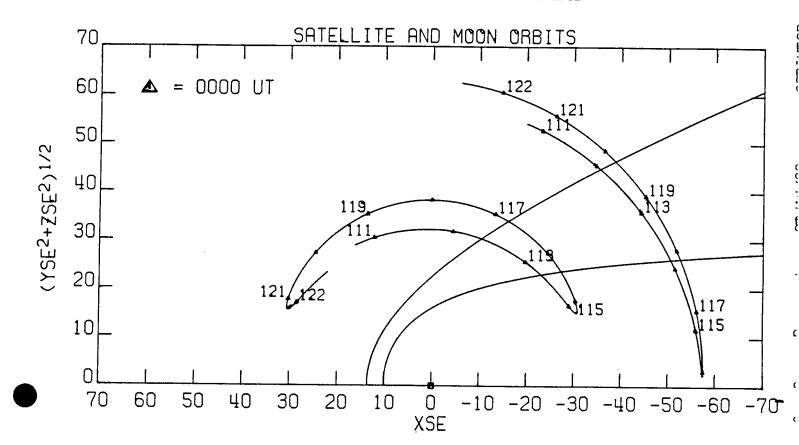
IMP 7 TRAJECTORY. ASCENDING NODE 77
FROM APR 8 TO APR 20 1975
DAYS 98 THRU 106

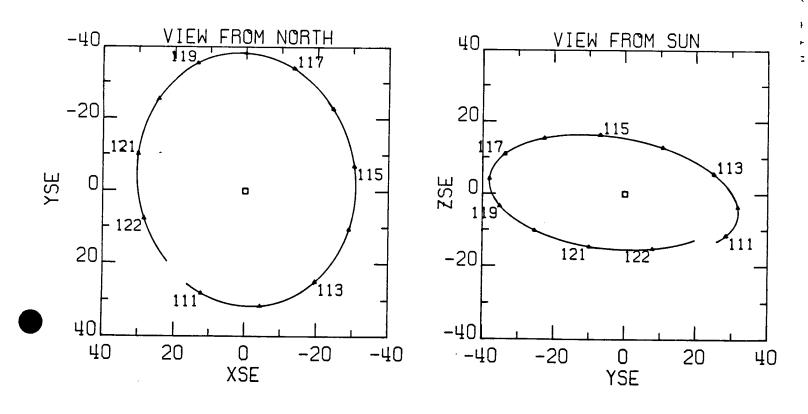


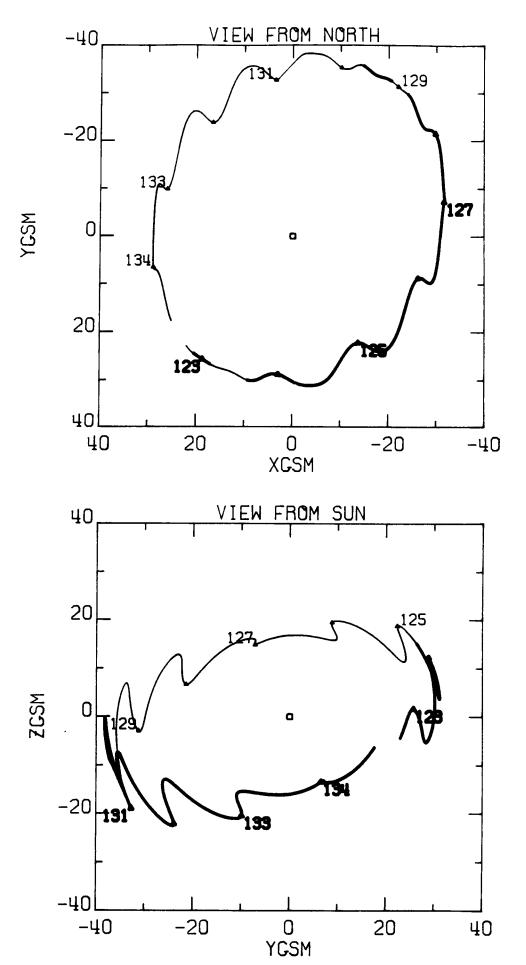




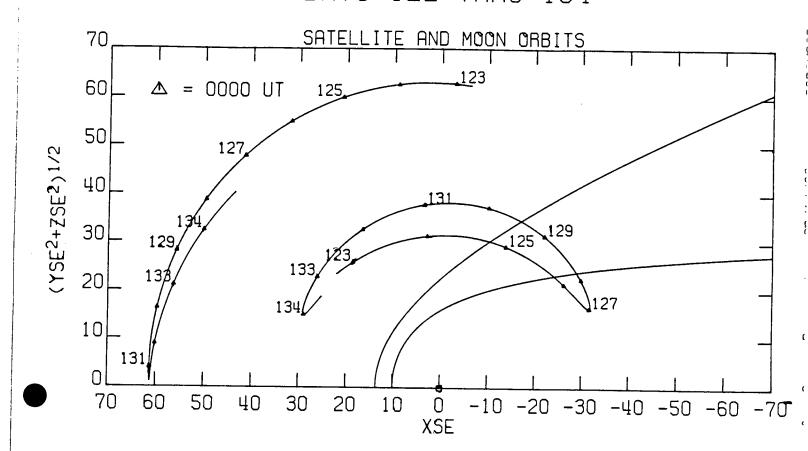
FROM APR 20 TO MAY 2 1975 DAYS 110 THRU 122

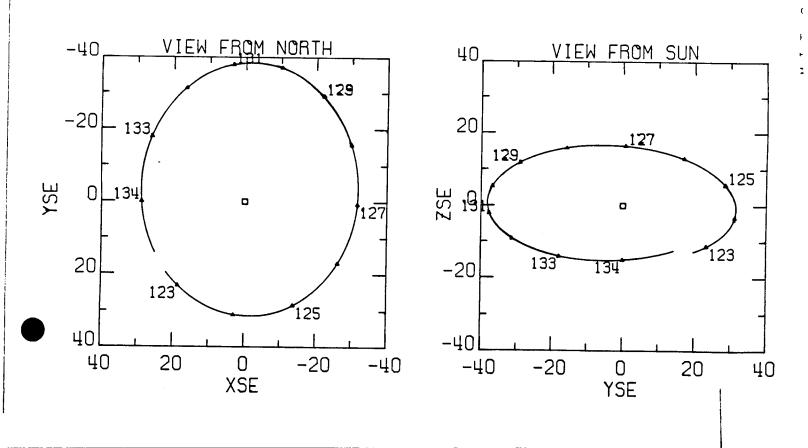


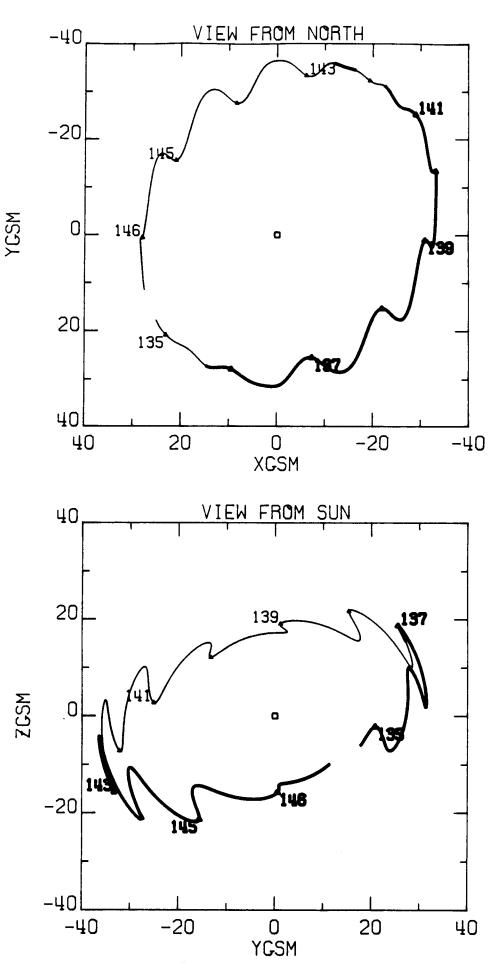




IMP 7 TRAJECTORY. ASCENDING NODE 79
FROM MAY 2 TO MAY 14 1975
DAYS 122 THRU 134







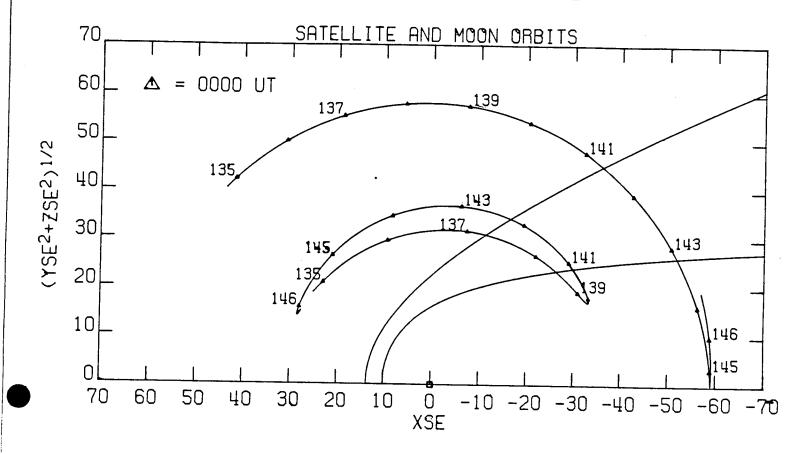
CSRIMPD1

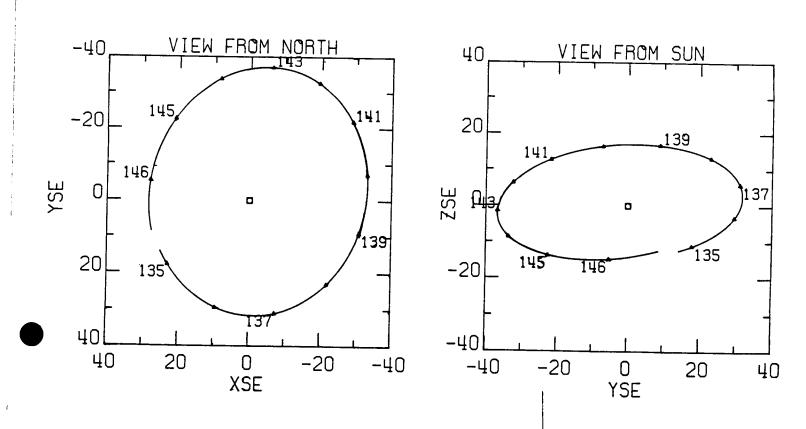
N3/14/88

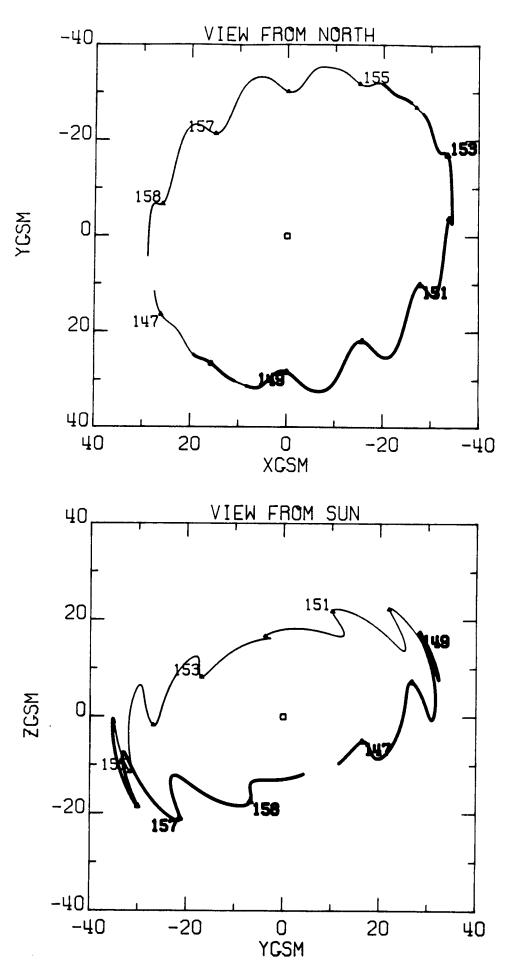
Baseary

Total

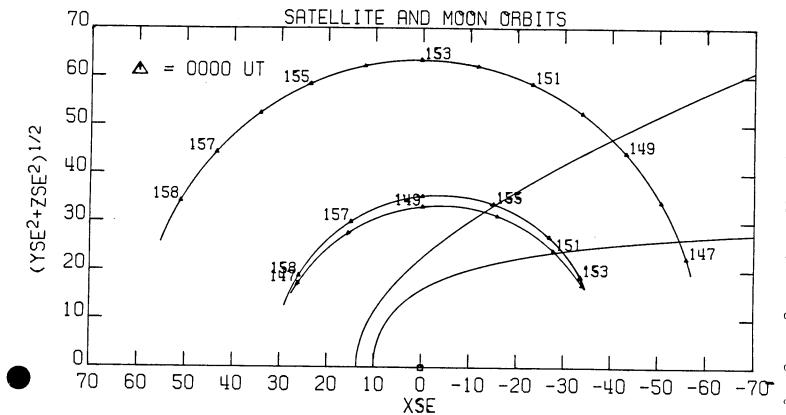
FROM MAY 14 TO MAY 26 1975
DAYS 134 THRU 146

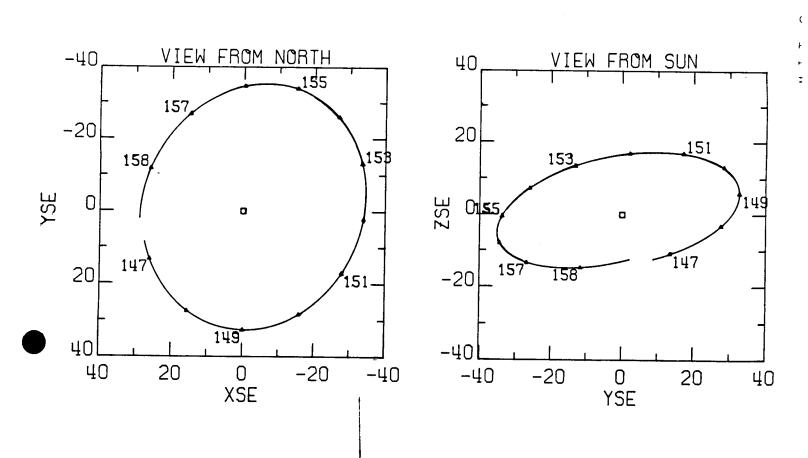


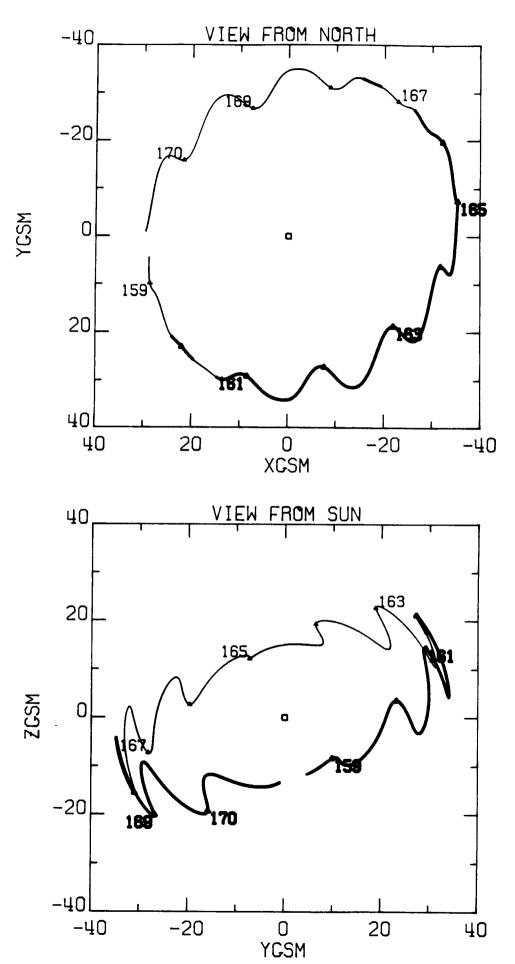




IMP 7 TRAJECTORY. ASCENDING NODE 81
FROM MAY 26 TO JUN 7 1975
DAYS 146 THRU 158



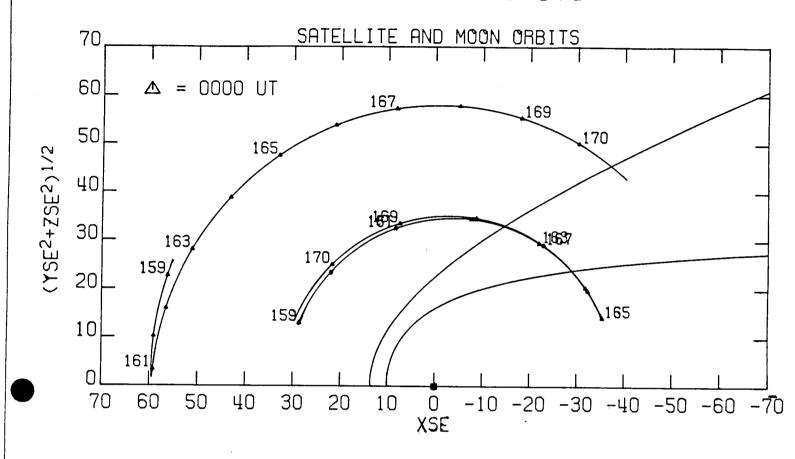


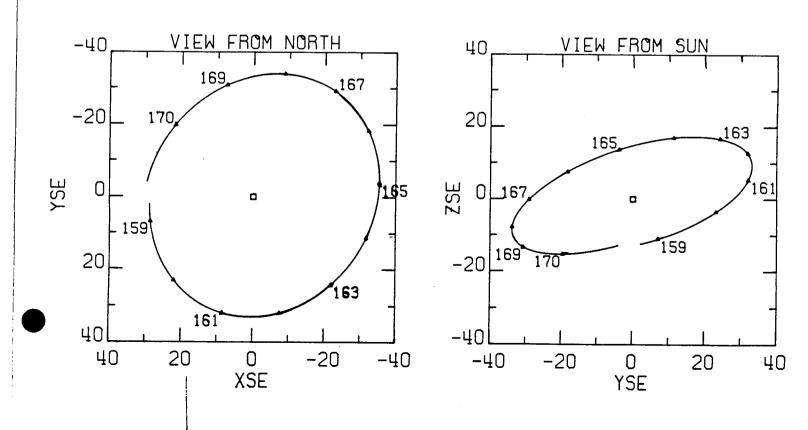


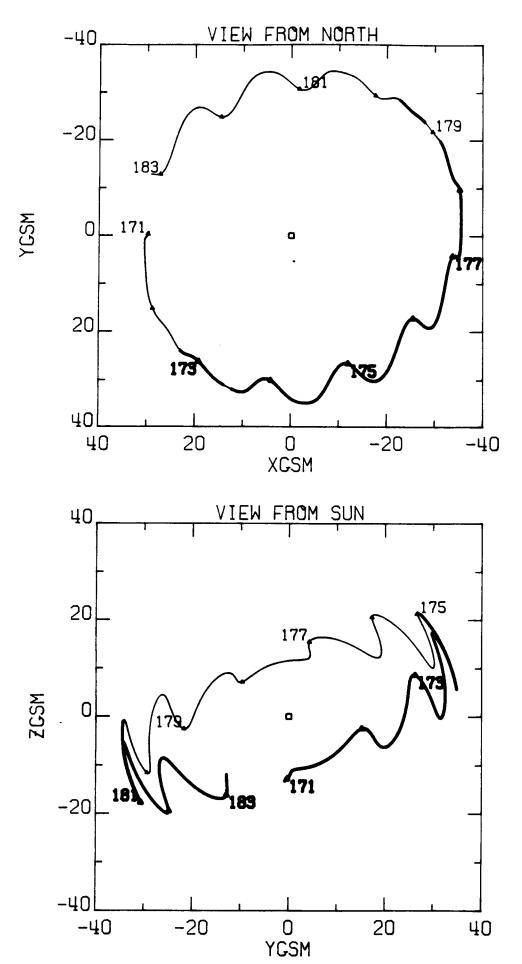
IMP 7 TRAJECTORY. ASCENDING NODE 82

FROM JUN 7 TO JUN 19 1975

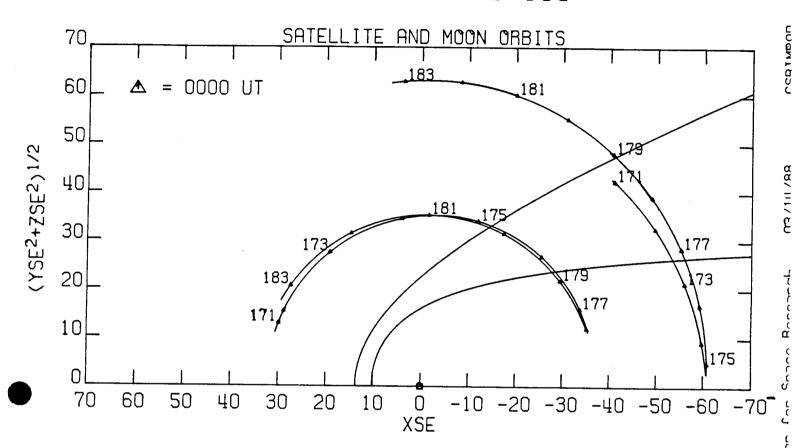
DAYS 158 THRU 170

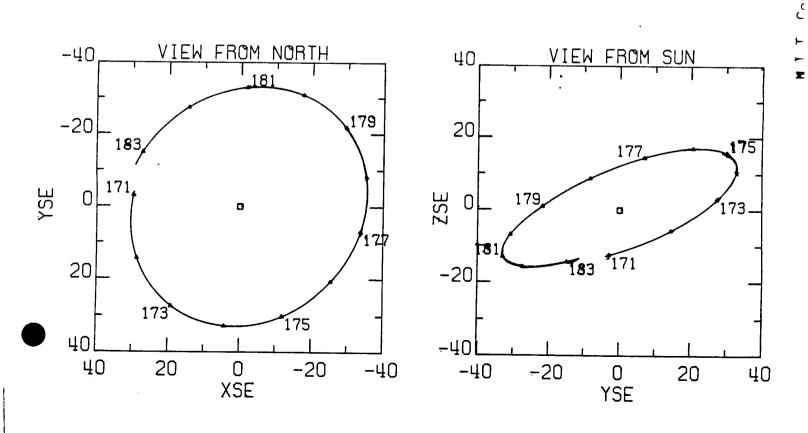


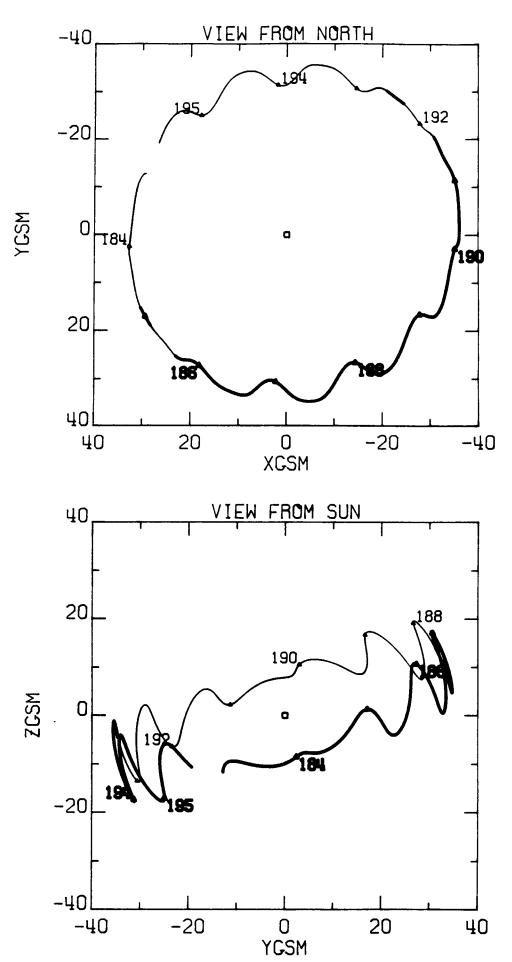




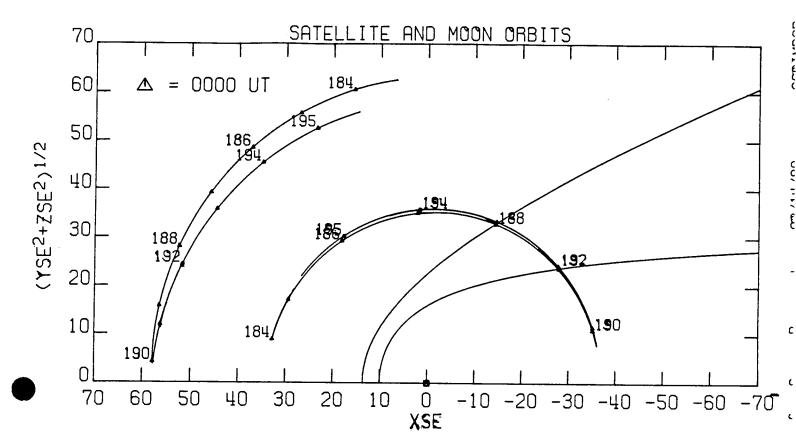
FROM JUN 19 TO JUL 2 1975 DAYS 170 THRU 183

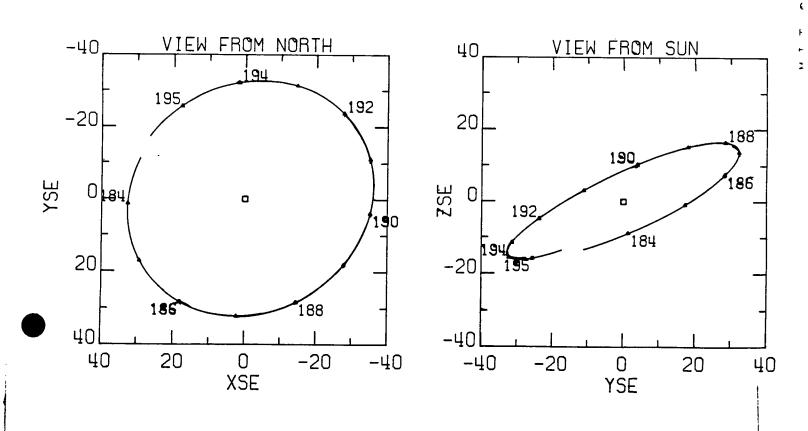


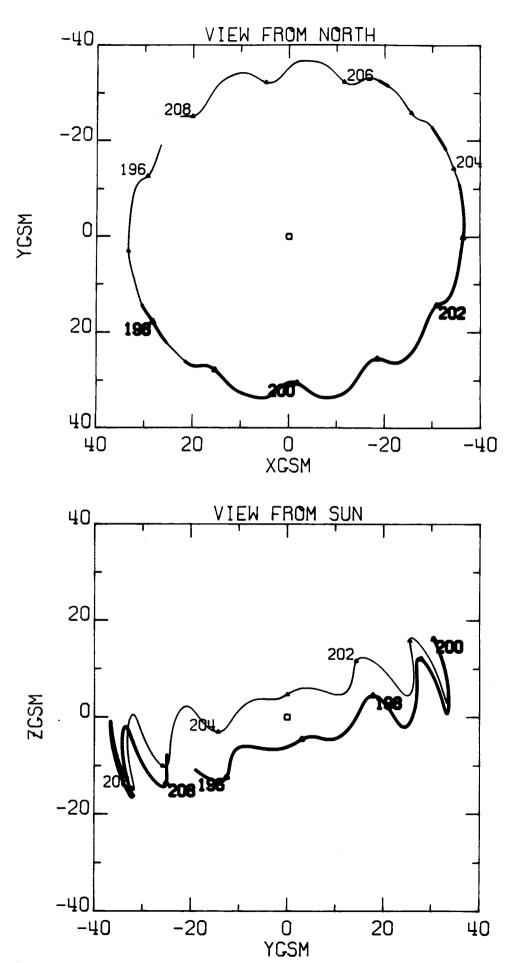




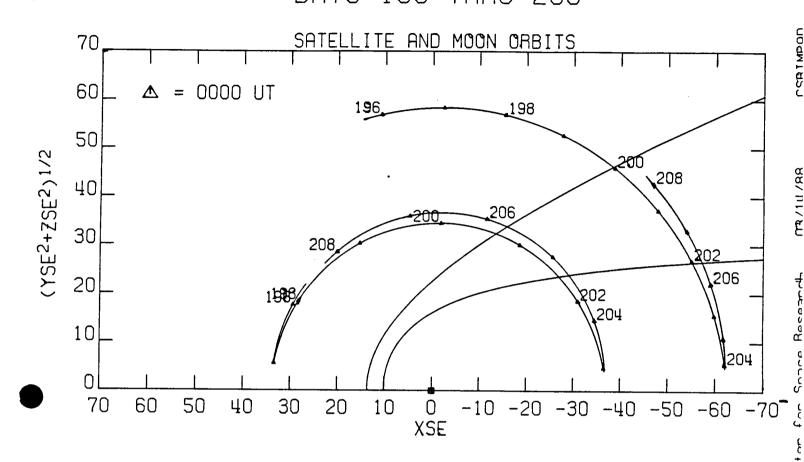
FROM JUL 2 TO JUL 14 1975 DAYS 183 THRU 195

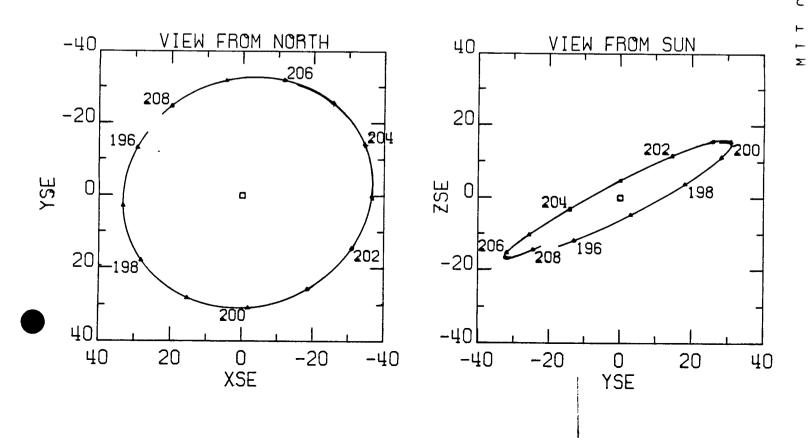


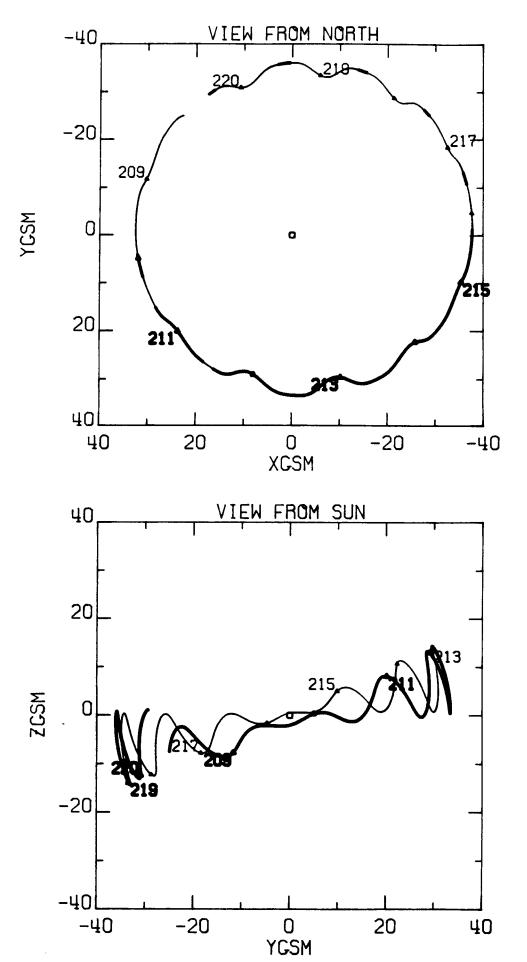




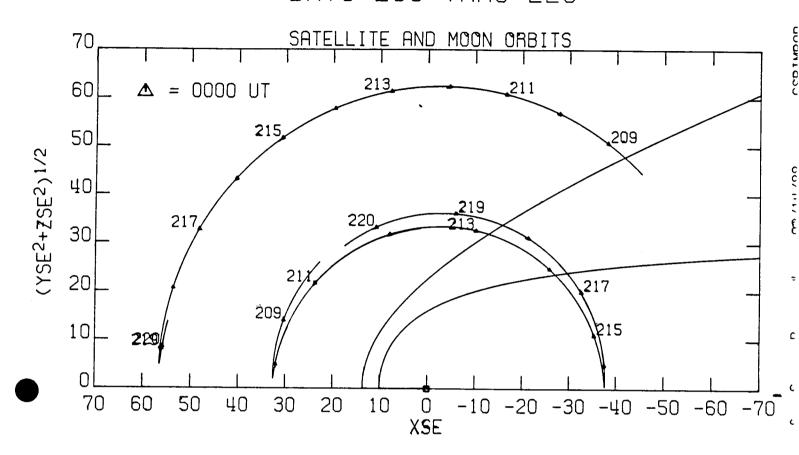
FROM JUL 14 TO JUL 27 1975 DAYS 195 THRU 208

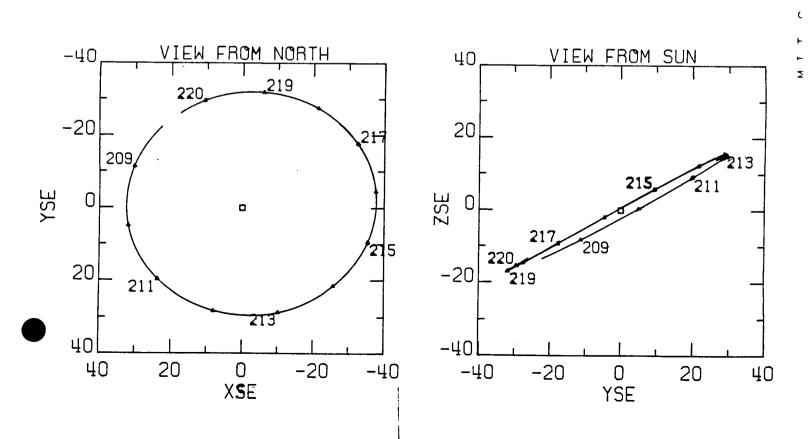


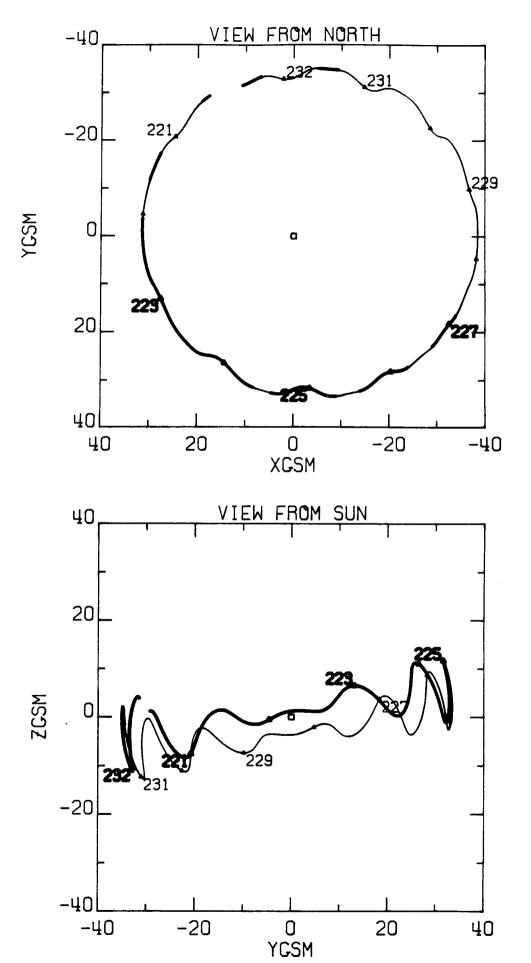




FROM JUL 27 TO AUG 8 1975 DAYS 208 THRU 220



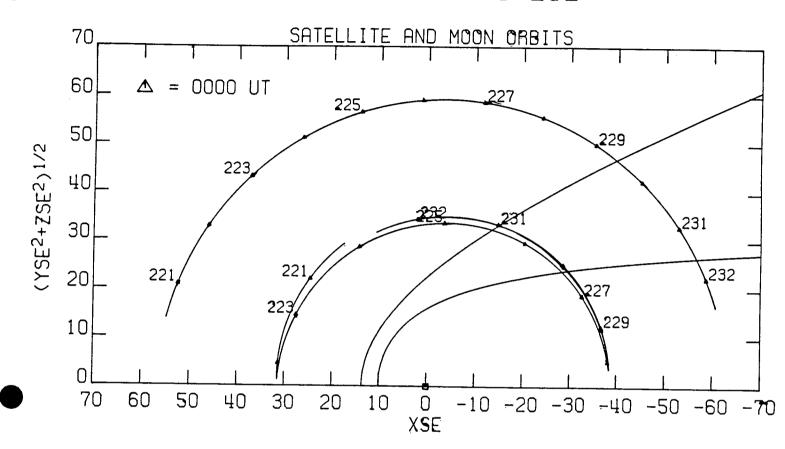


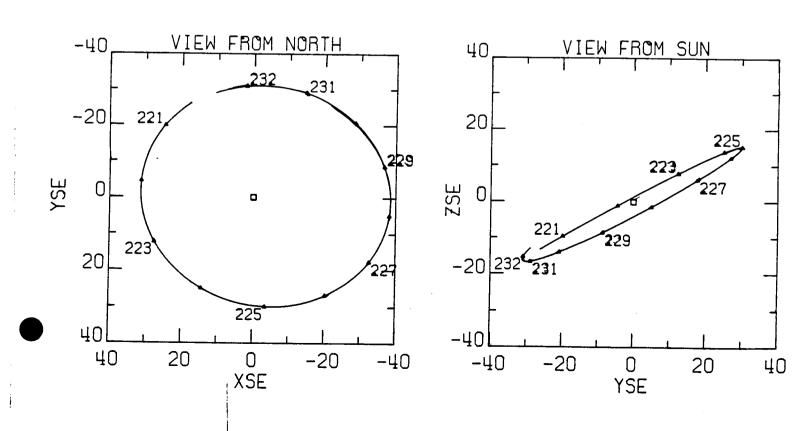


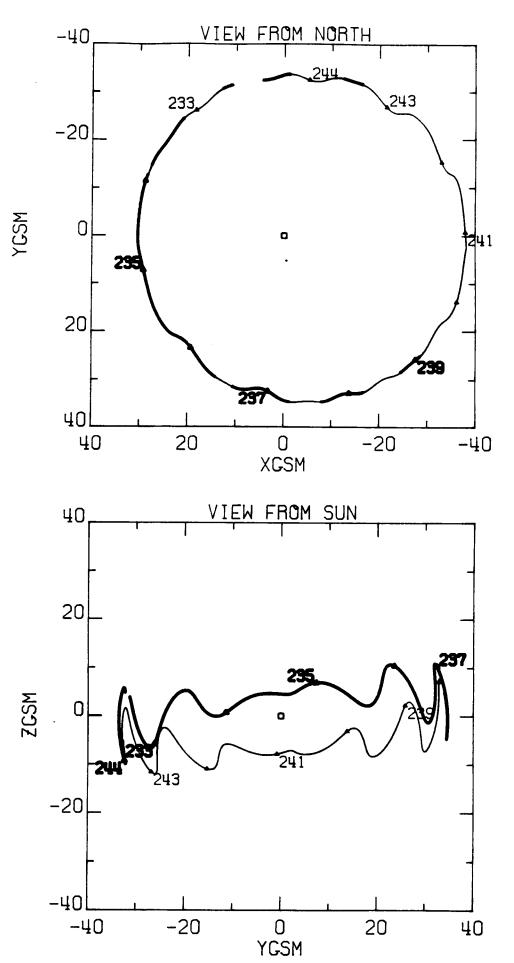
IMP 7 TRAJECTORY.

ASCENDING NODE 87

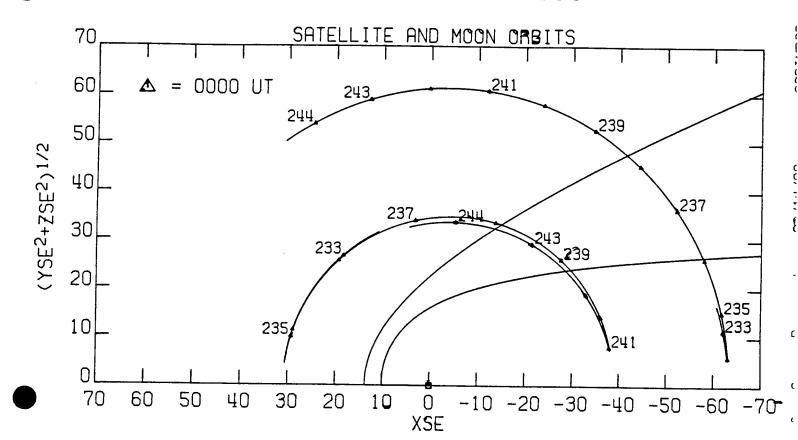
FROM AUG 8 TO AUG 20 1975 DAYS 220 THRU 232

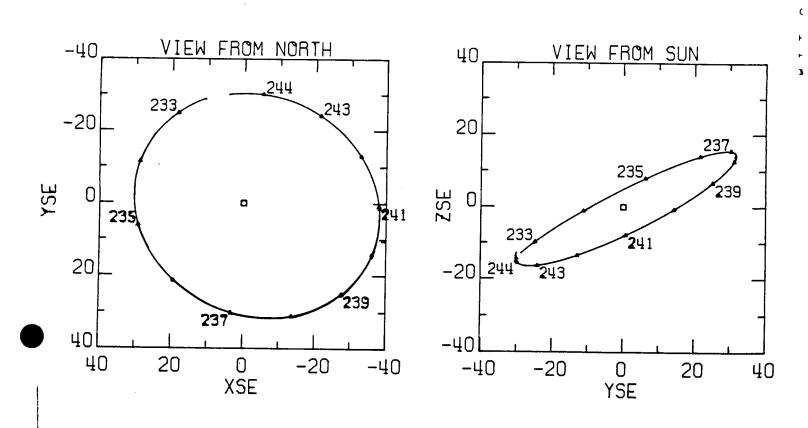


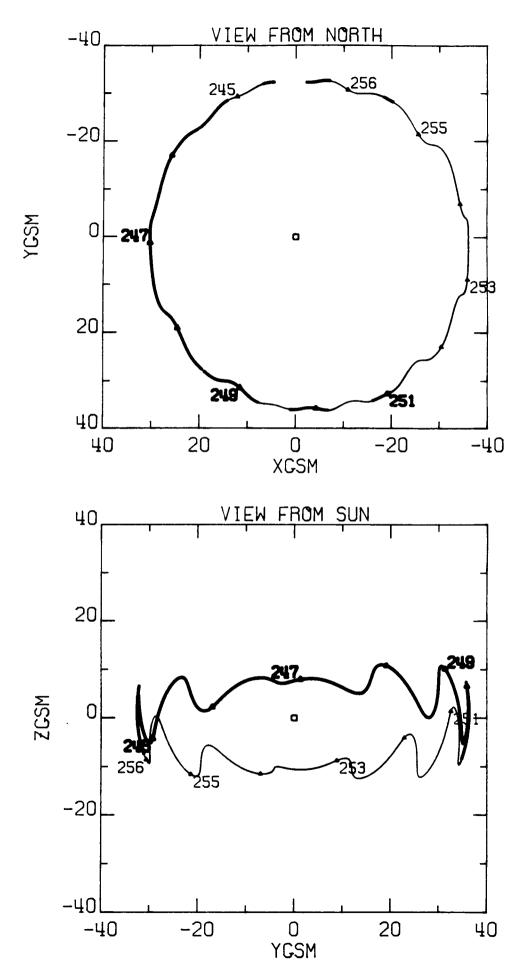




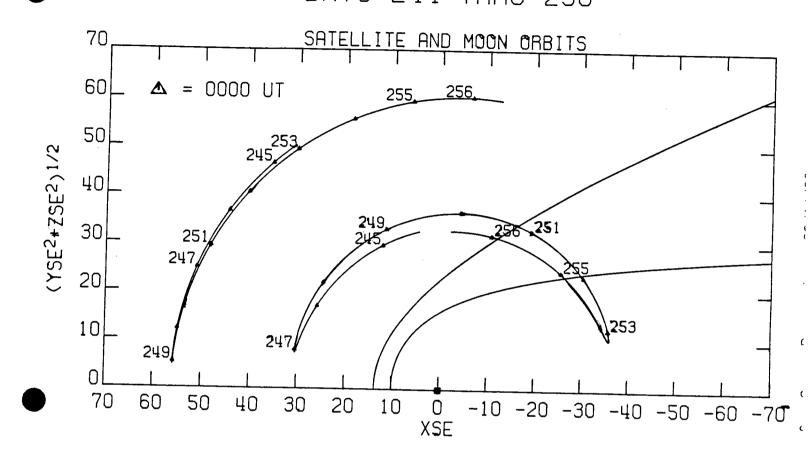
FROM AUG 20 TO SEP 1 1975 DAYS 232 THRU 244

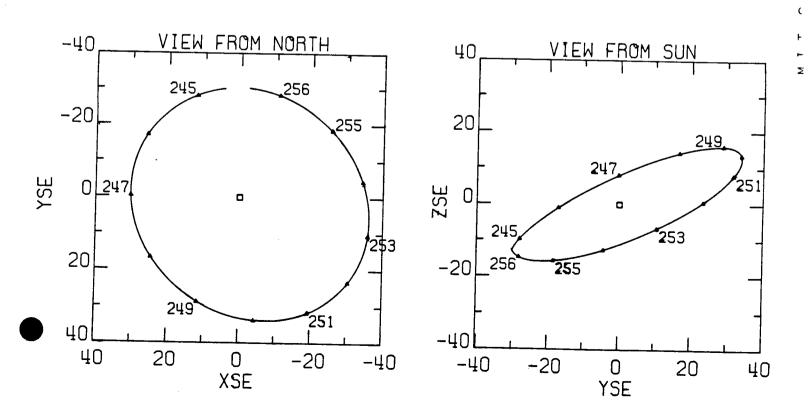


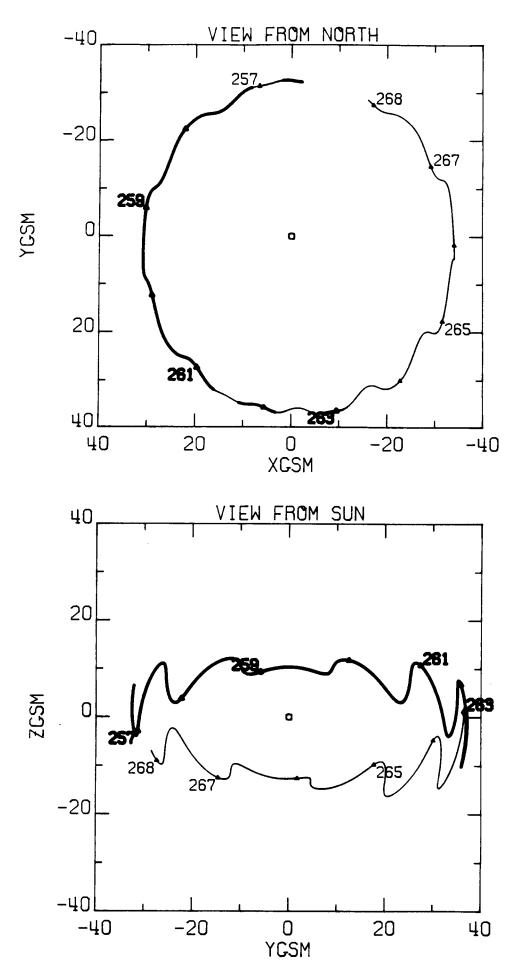




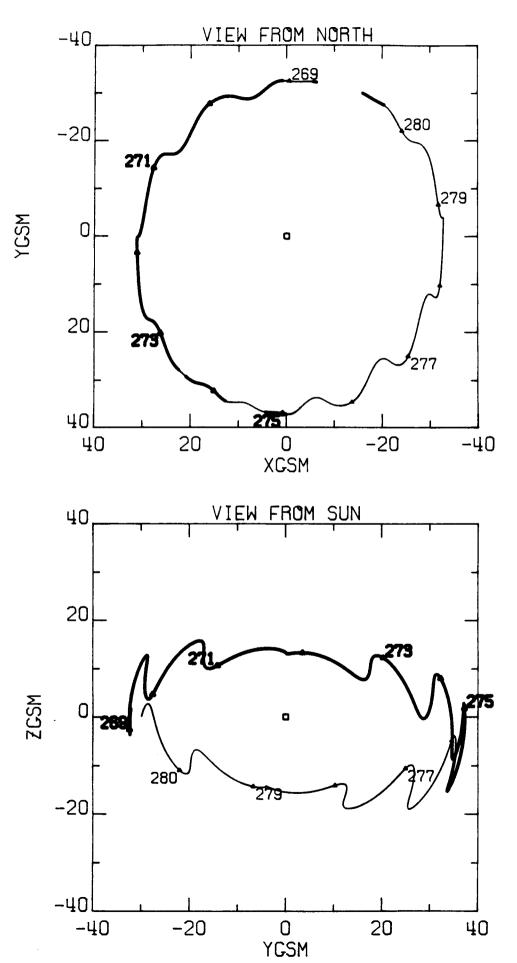
IMP 7 TRAJECTORY. ASCENDING NODE 89
FROM SEP 1 TO SEP 13 1975
DAYS 244 THRU 256



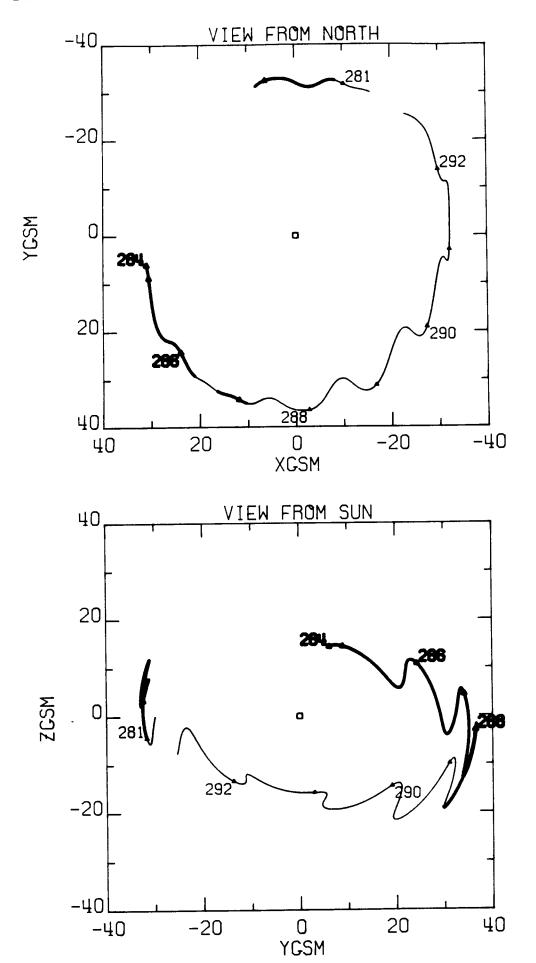




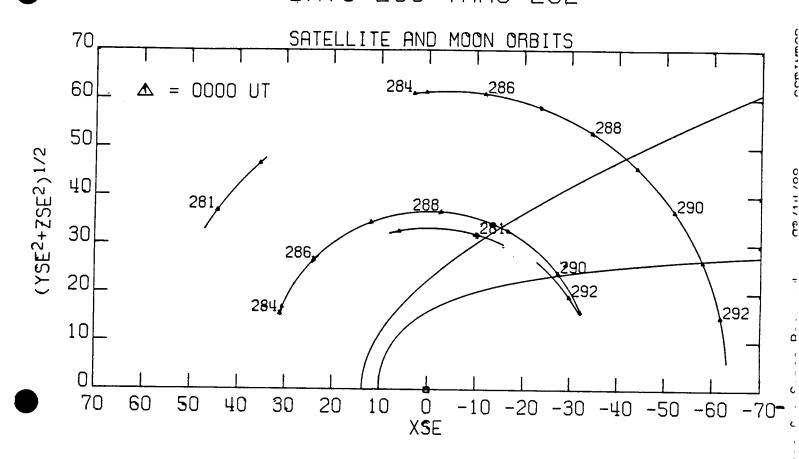
IMP 7 TRAJECTORY. ASCENDING NODE 90 FROM SEP 13 TO SEP 25 1975 DAYS 256 THRU 268 SATELLITE AND MOON ORBITS = 0000 UT(YSE<sup>2</sup>+2SE<sup>2</sup>)1/2 \_268 -10 -20 -30 -40 -50 -60 -70<del>-</del> XSE VIEW FROM NORTH -40 VIEW FROM SUN -20 **-25**9 2\$3 YSE **ZSE** -20 -40 XSE -20 -40 -40 -20 YŠE

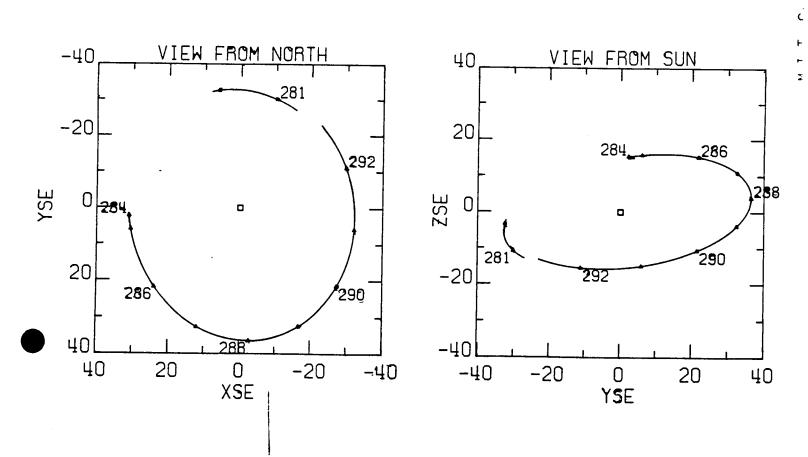


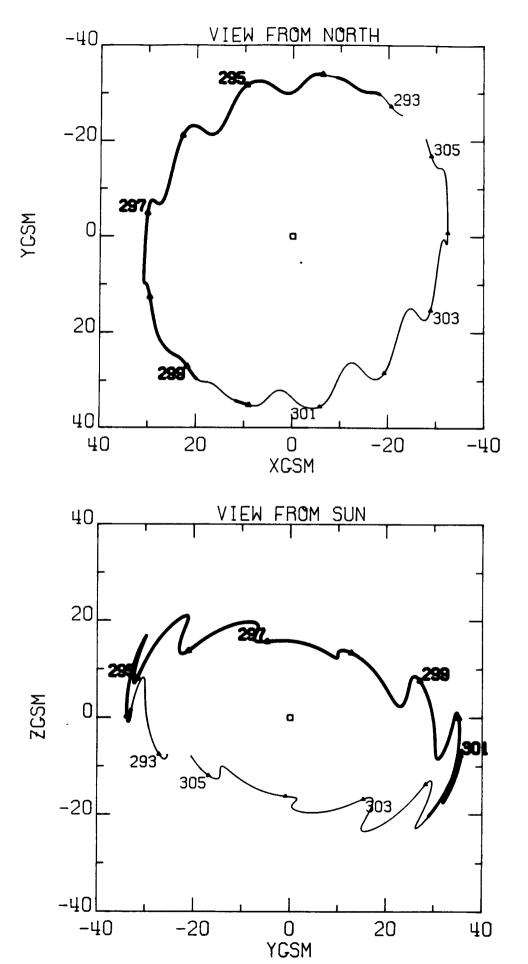
IMP 7 TRAJECTORY. ASCENDING NODE 91 FROM SEP 25 TO OCT 7 DAYS 268 THRU 280 SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 T3/14/88 275. M.I.T Center for Share Research -30 XSE -10 -20 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 273. 79 YSE **ZSE** -20 -40 XSE -20 -40 -40 -20 YSE 



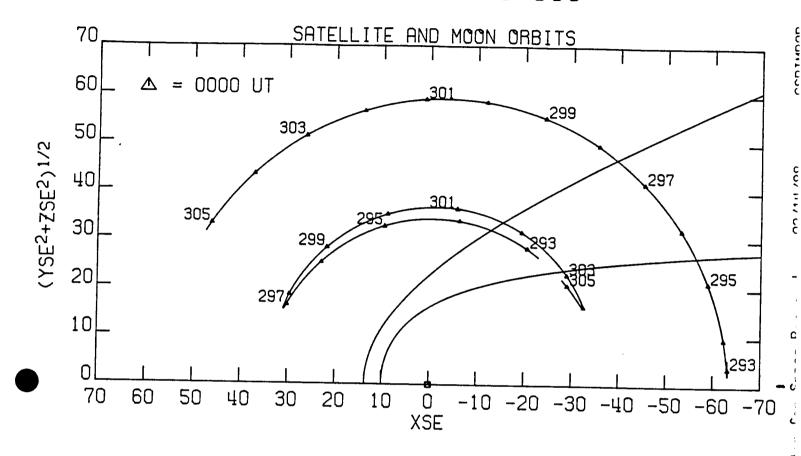
FROM OCT 7 TO OCT 19 1975 DAYS 280 THRU 292

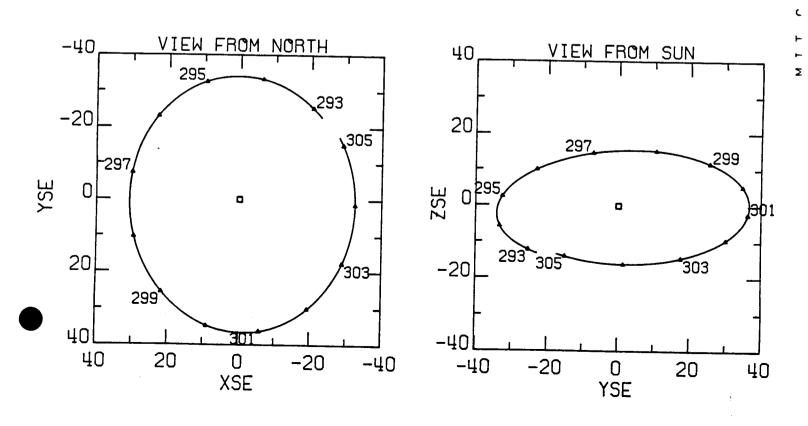


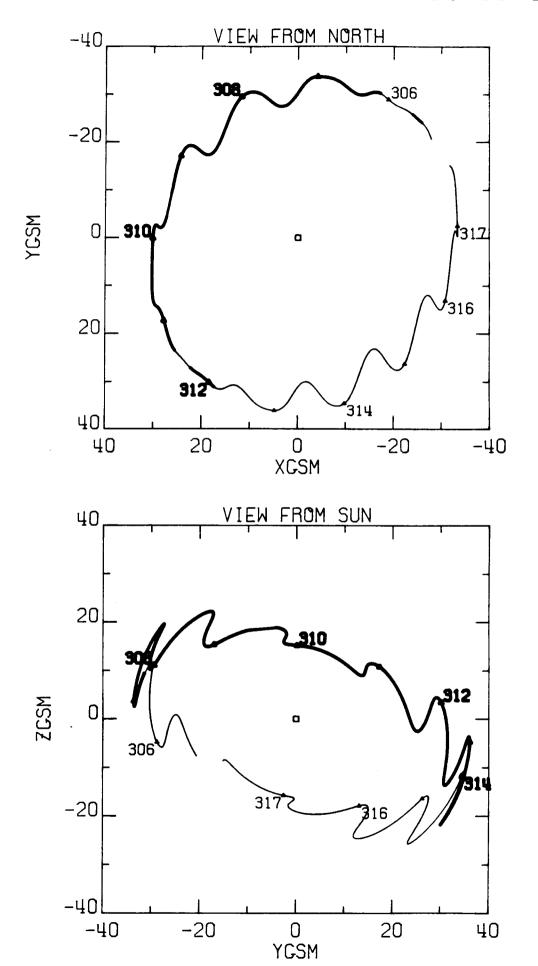




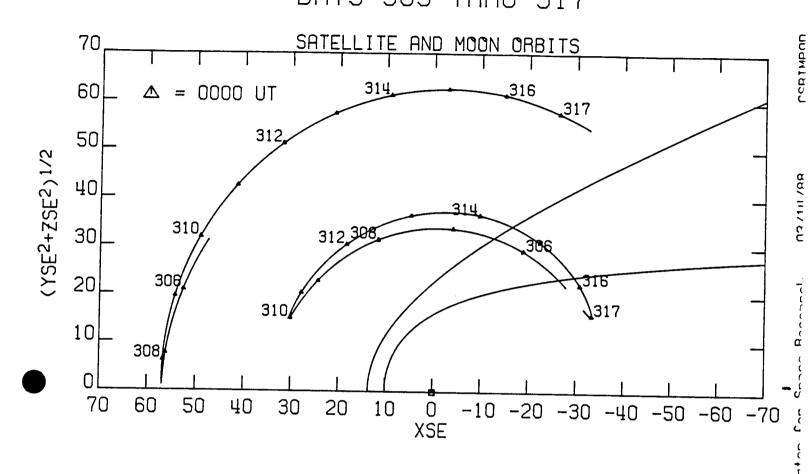
FROM OCT 19 TO NOV 1 1975 DAYS 292 THRU 305

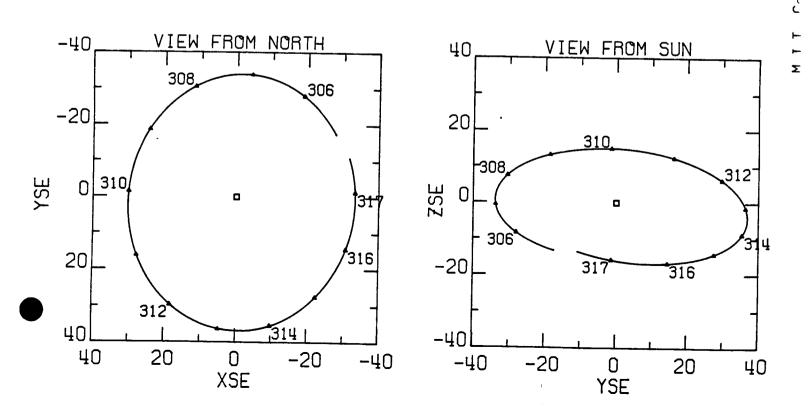


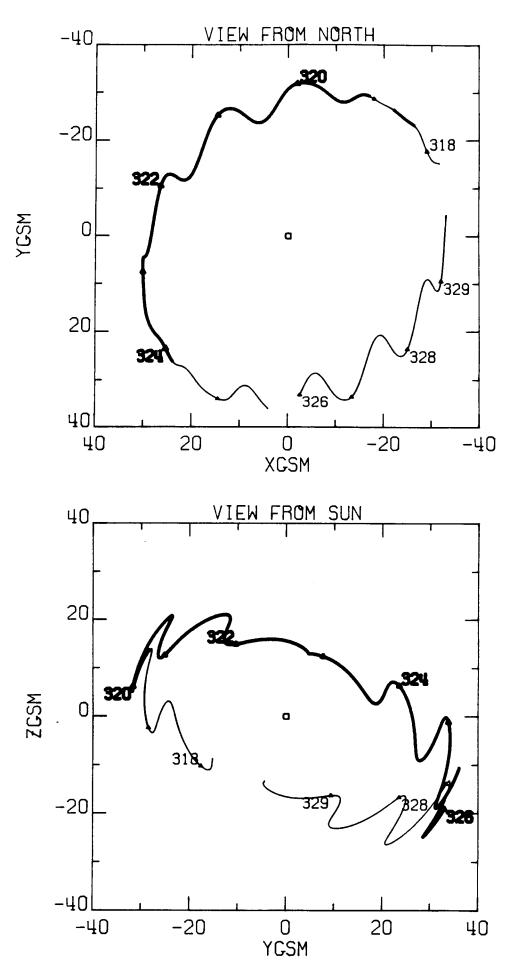




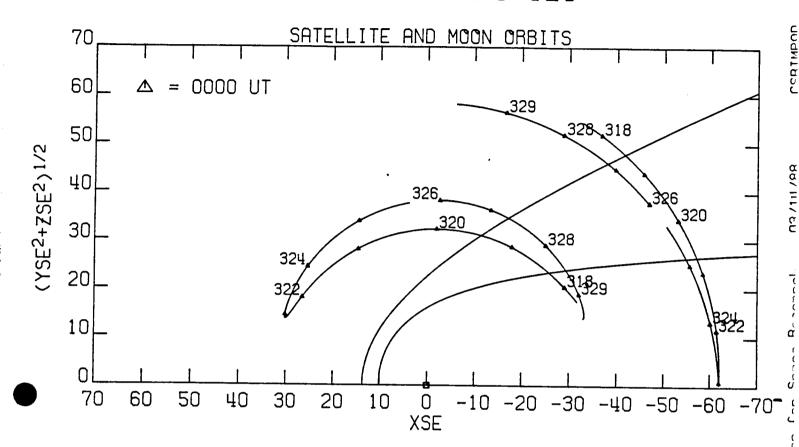
IMP 7 TRAJECTORY. ASCENDING NODE 94
FROM NOV 1 TO NOV 13 1975
DAYS 305 THRU 317

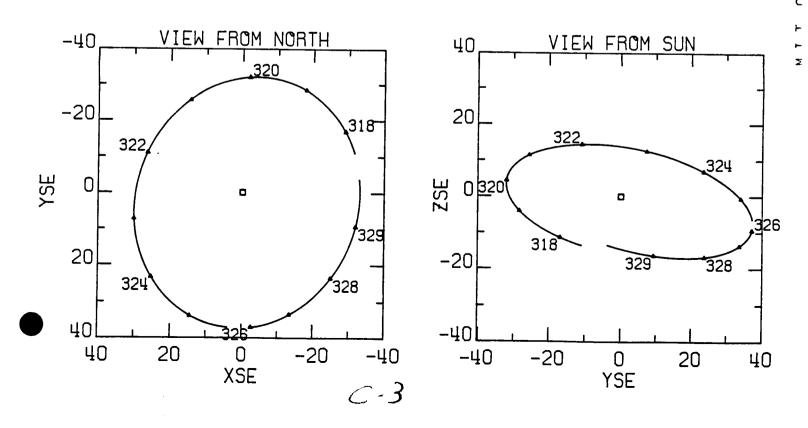


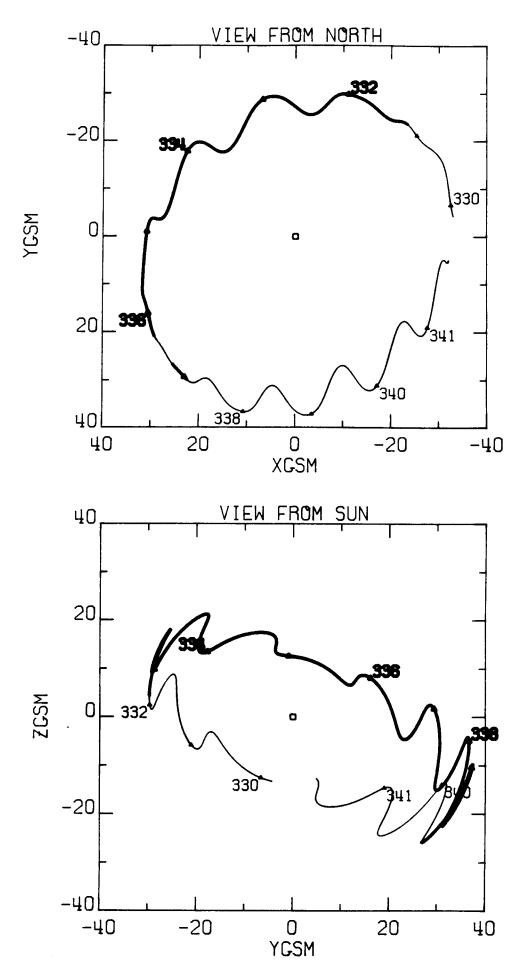




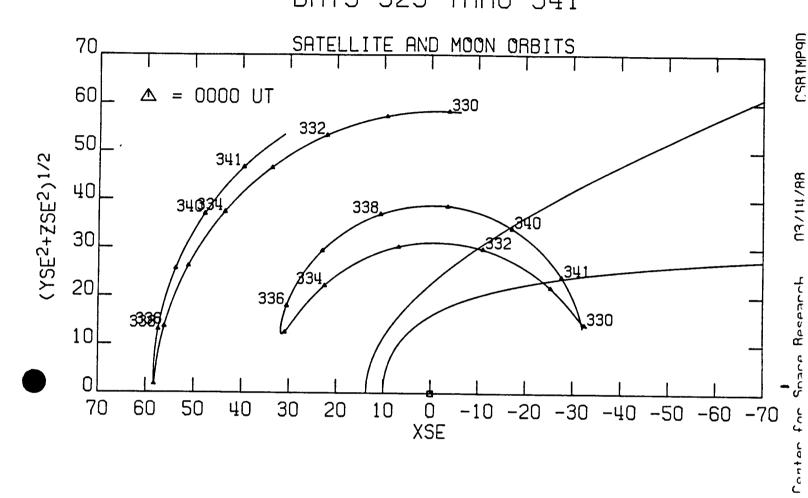
FROM NOV 13 TO NOV 25 1975 DAYS 317 THRU 329

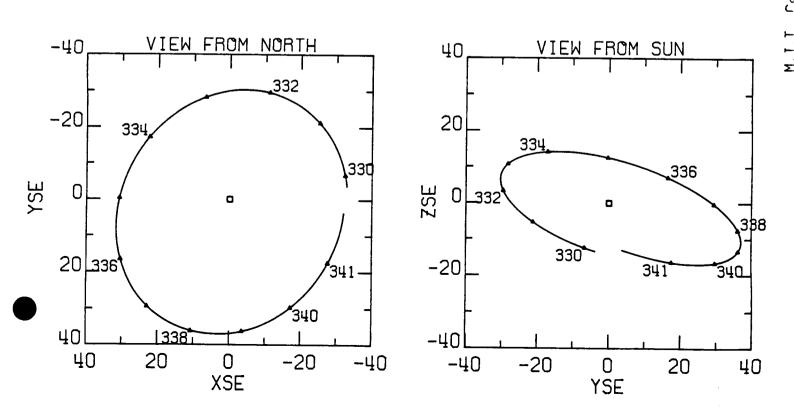


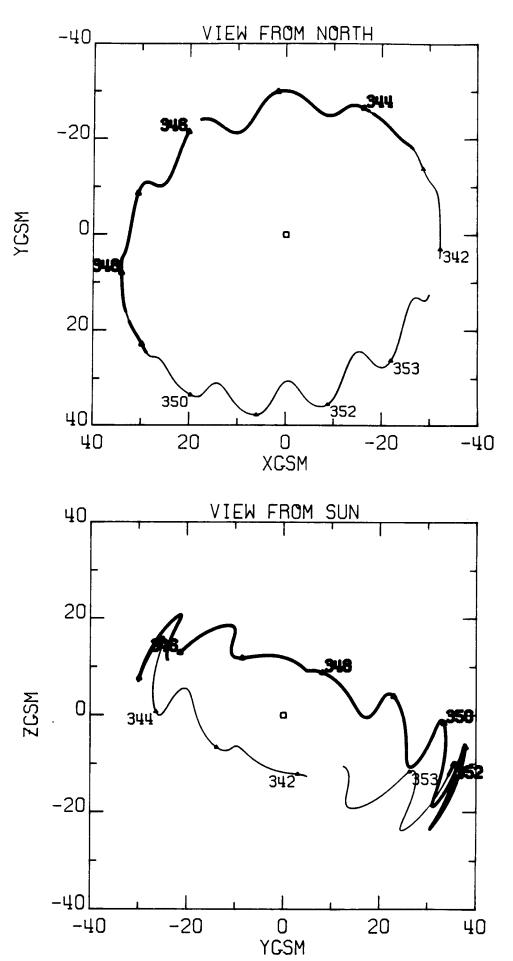




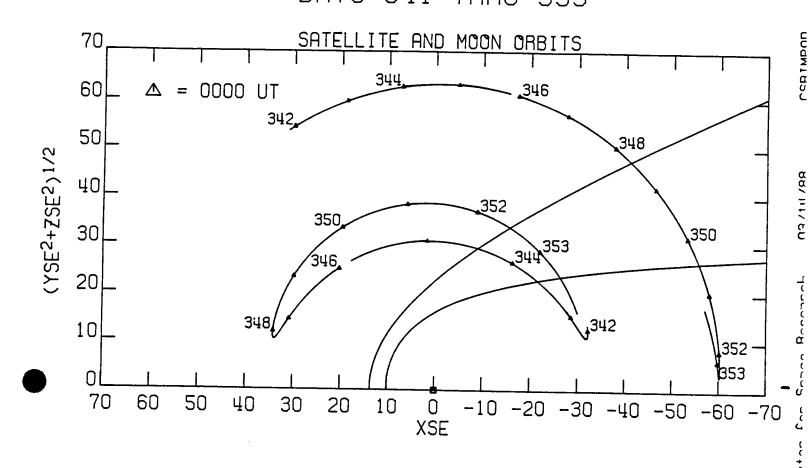
IMP 7 TRAJECTORY. ASCENDING NODE 96
FROM NOV 25 TO DEC 7 1975
DAYS 329 THRU 341

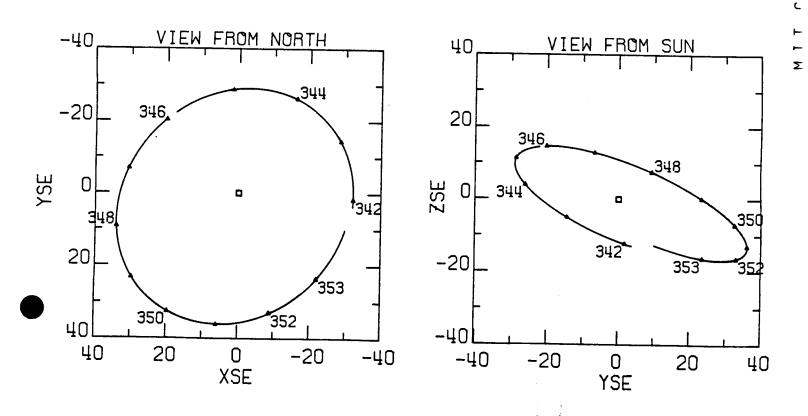


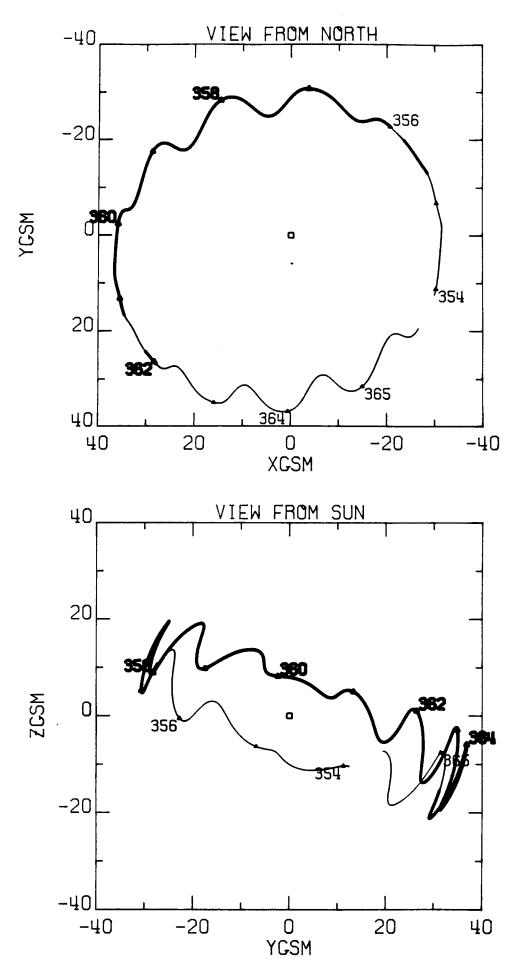




IMP 7 TRAJECTORY... ASCENDING NODE 97
FROM DEC 7 TO DEC 19 1975
DAYS 341 THRU 353



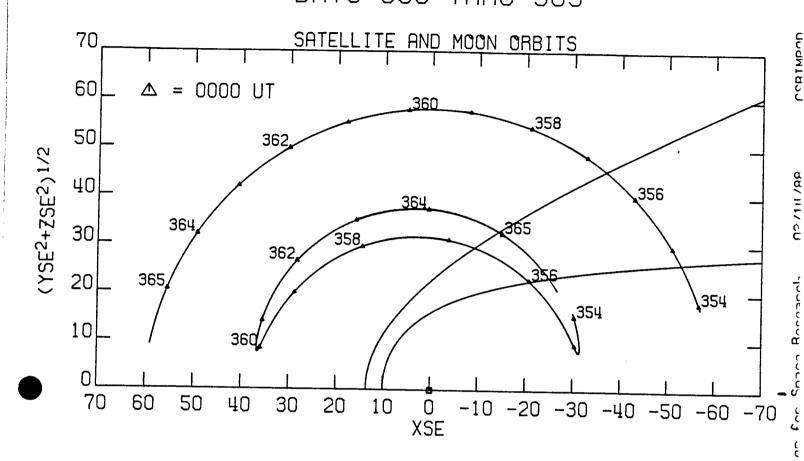


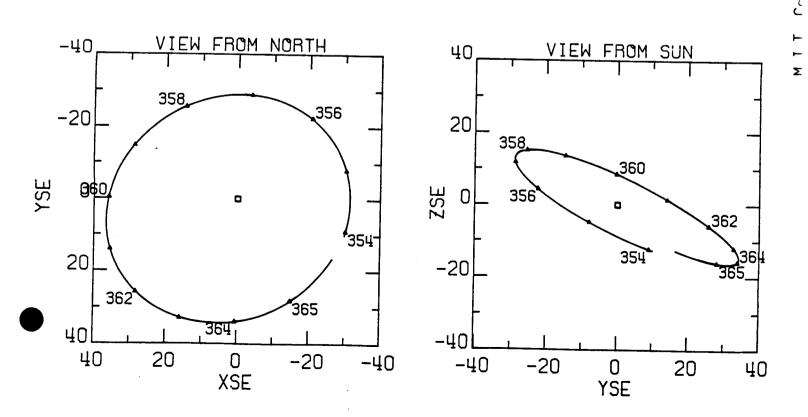


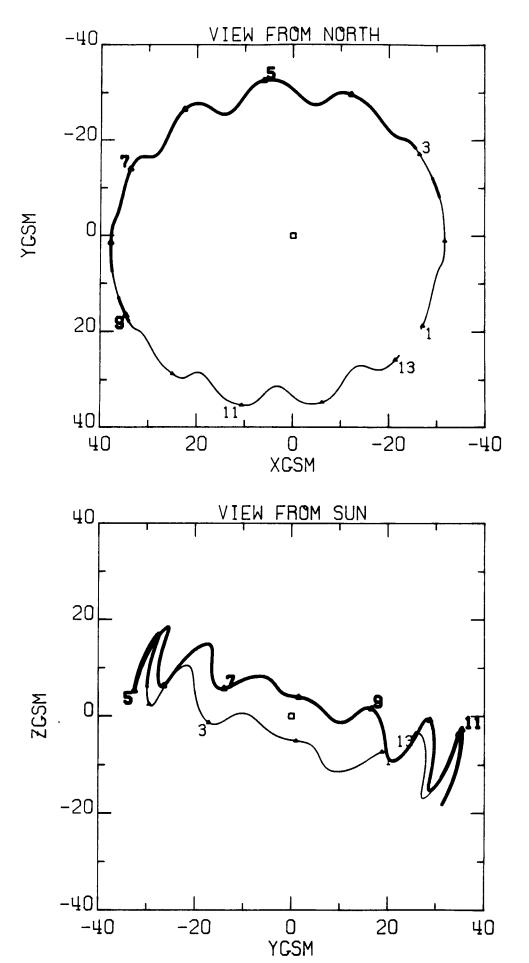
IMP 7 TRAJECTORY. ASCENDING NODE 98

FROM DEC 19 TO DEC 31 1975

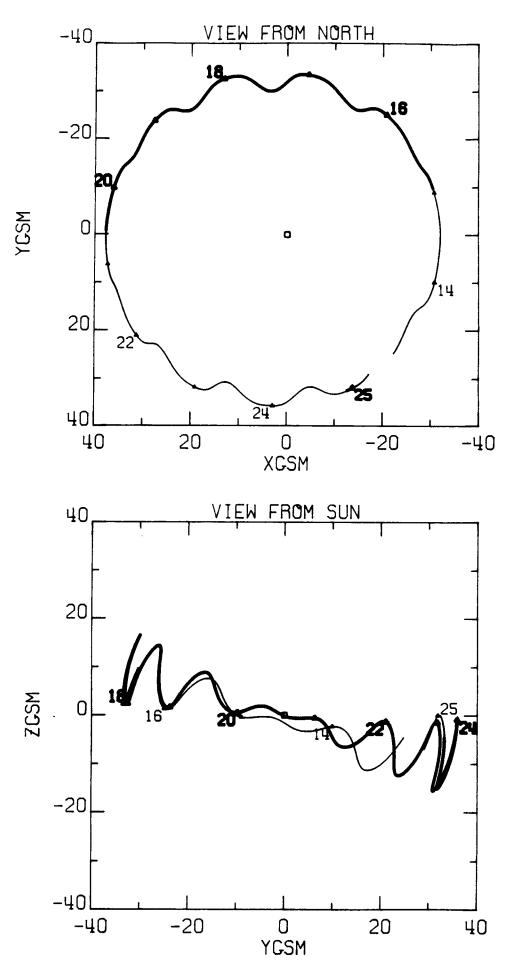
DAYS 353 THRU 365



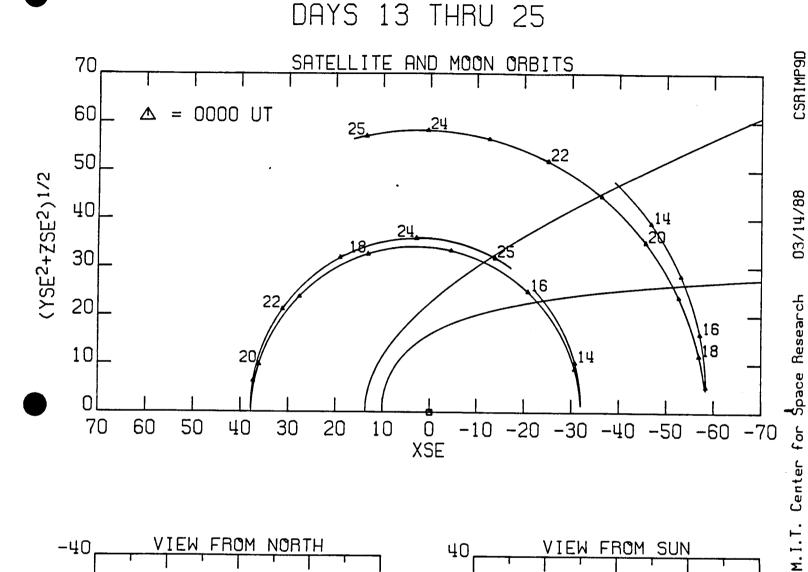


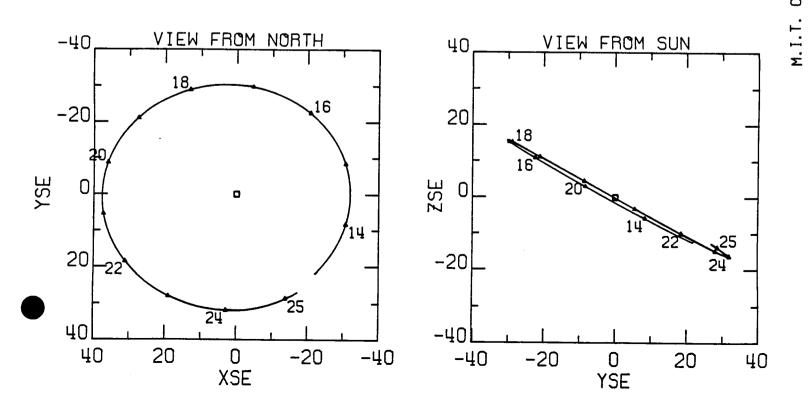


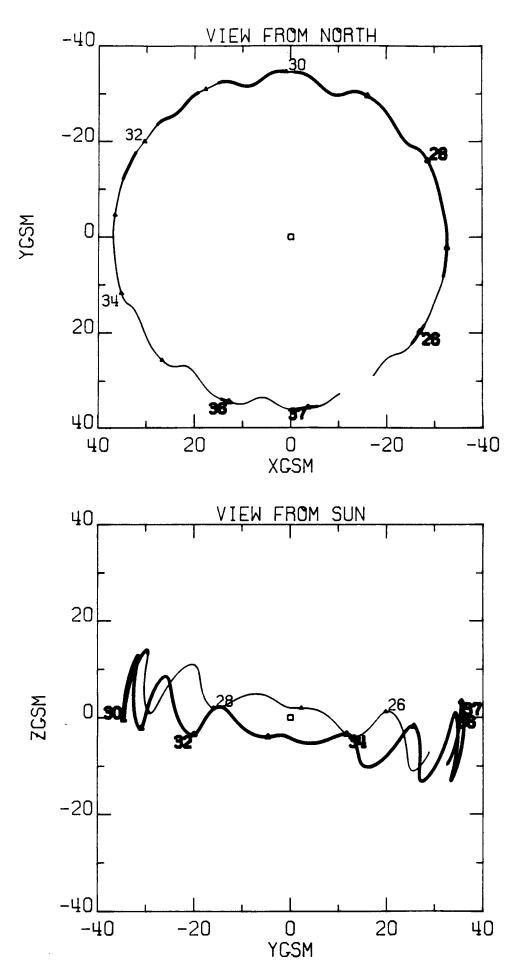
IMP 7 TRAJECTORY. ASCENDING NODE 99 FROM DEC 31 TO JAN 13 1976 DAYS 365 THRU SATELLITE AND MOON ORBITS 70 60 0000 UT 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 N3/14/88 40 30 13 20 M.I.T. Center for Snace Research 10 50 70 60 40 30 Ö XSE 20 10 -10 -20 -30 -50 -40 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 -20 20 YSE 0 ZSE 20 1 13 -20 11 40 -40 0 XSE 40 20 -20 -40 -40 -20 0 YSE 20 40



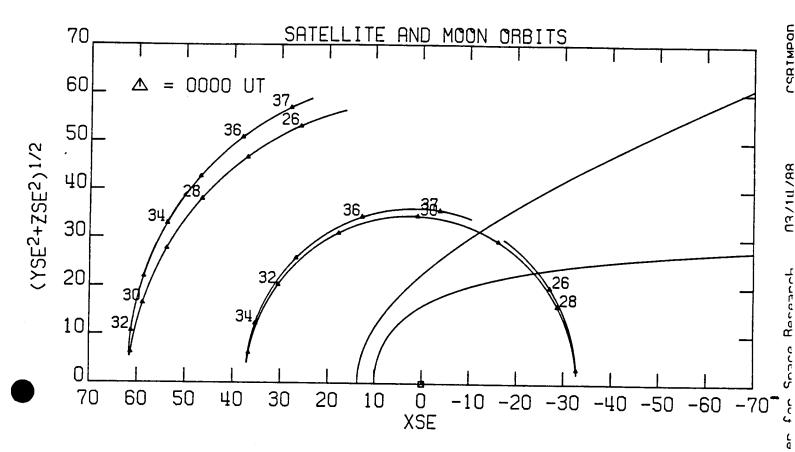
IMP 7 TRAJECTORY. ASCENDING NODE 100
FROM JAN 13 TO JAN 25 1976

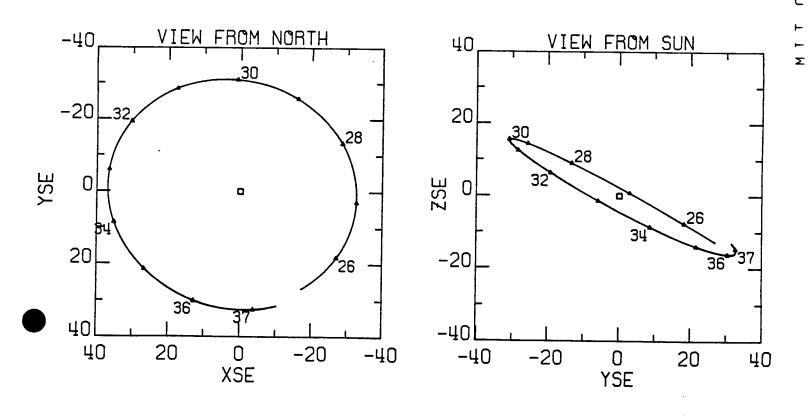


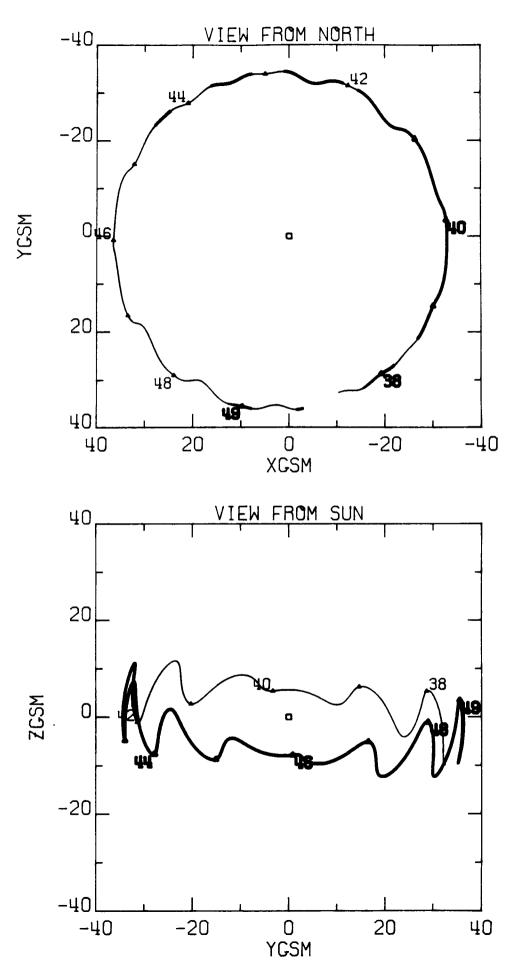




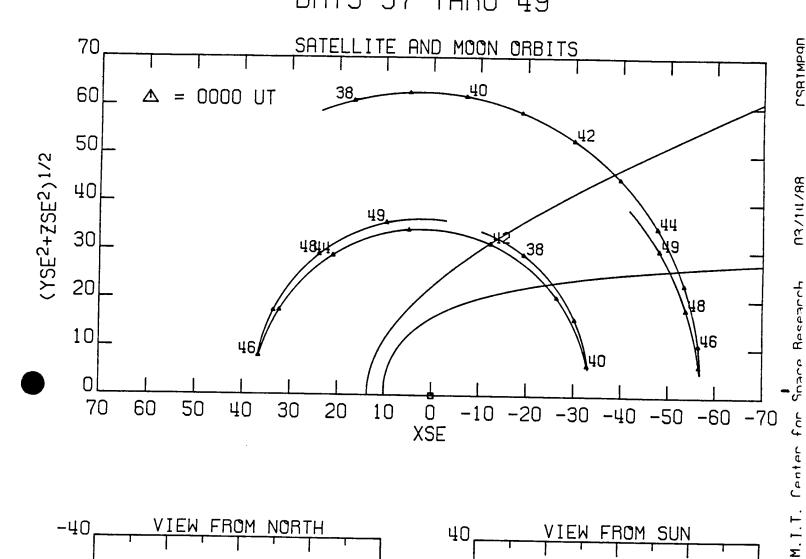
FROM JAN 25 TO FEB 6 1976 DAYS 25 THRU 37

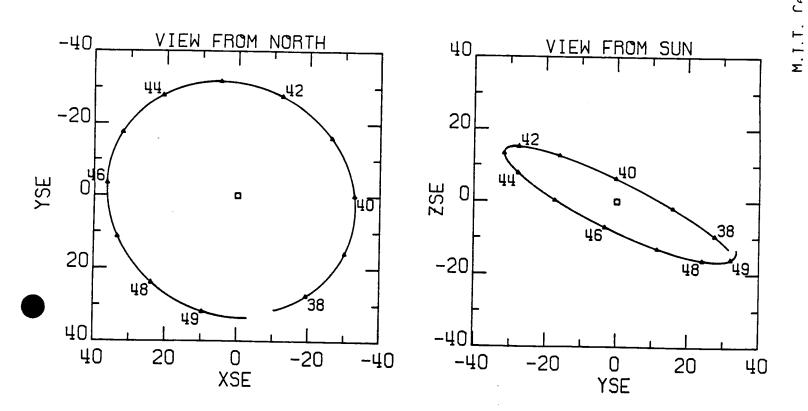


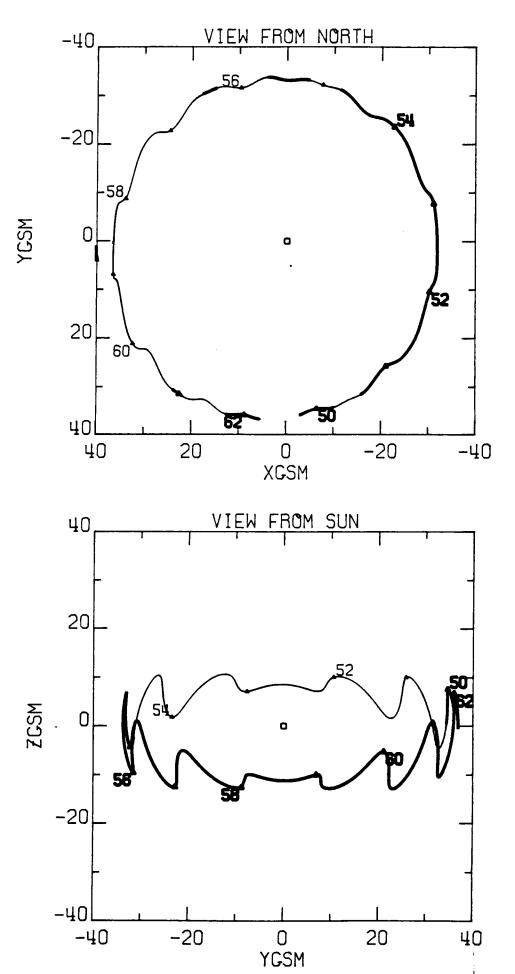




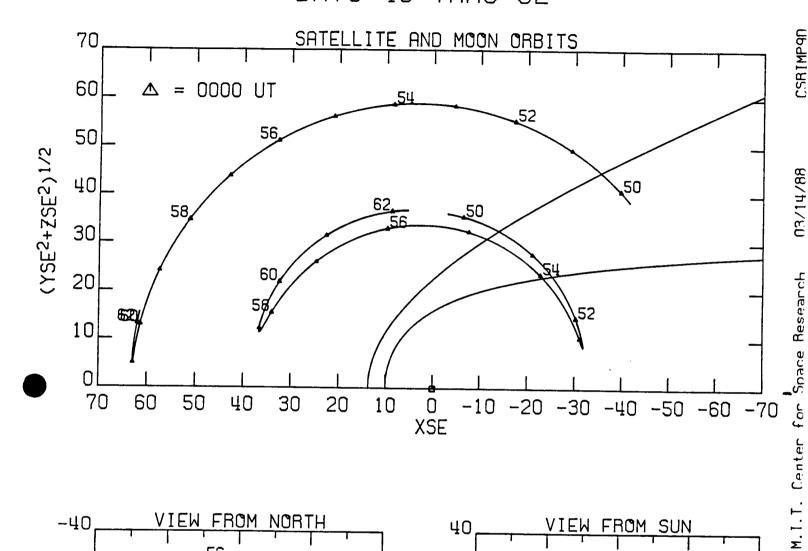
IMP 7 TRAJECTORY. ASCENDING NODE 102
FROM FEB 6 TO FEB 18 1976
DAYS 37 THRU 49

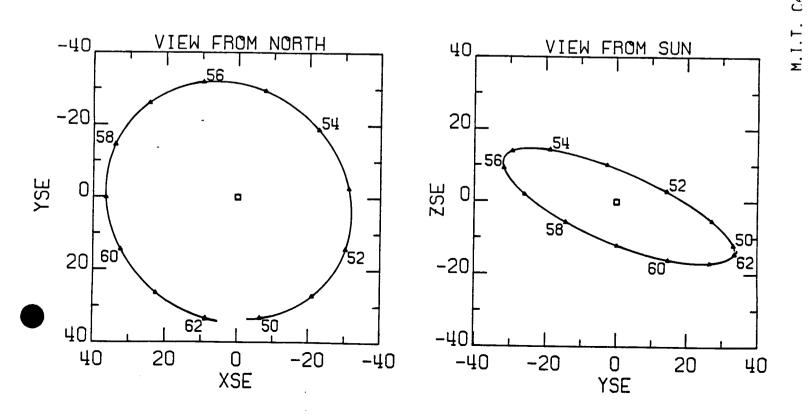


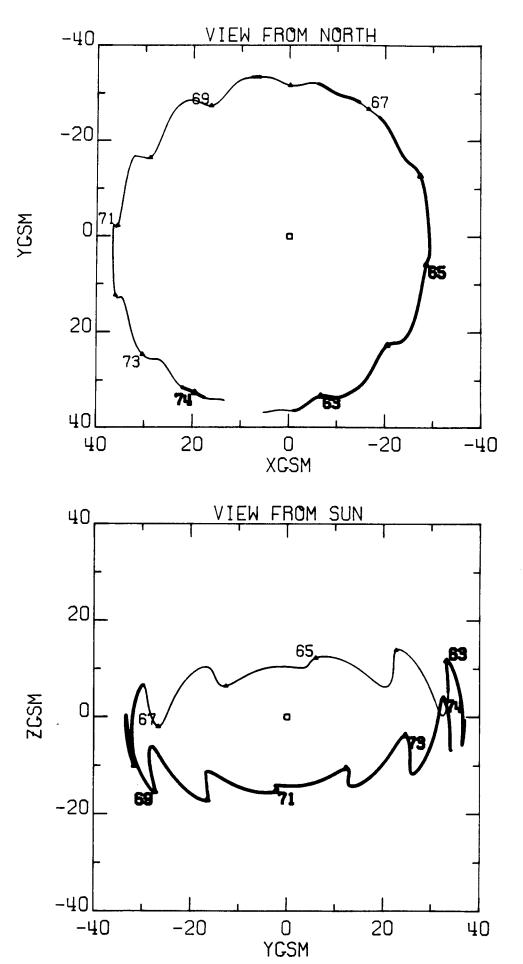




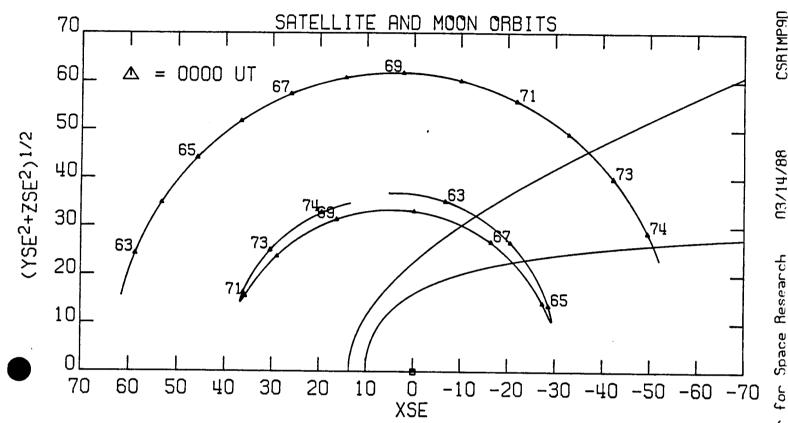
IMP 7 TRAJECTORY. ASCENDING NODE 103
FROM FEB 18 TO MAR 2 1976
DAYS 49 THRU 62

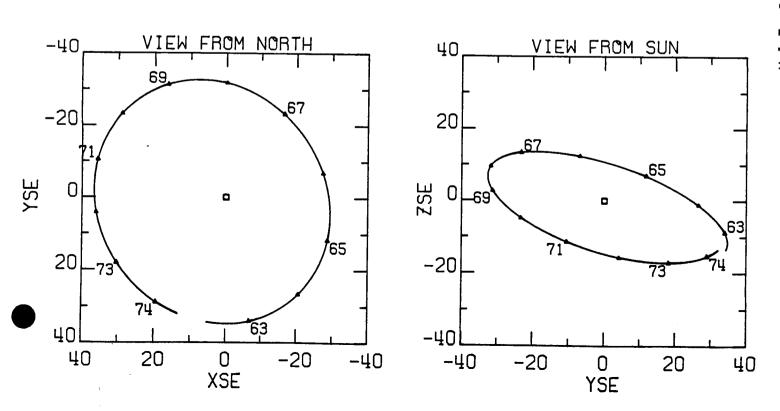




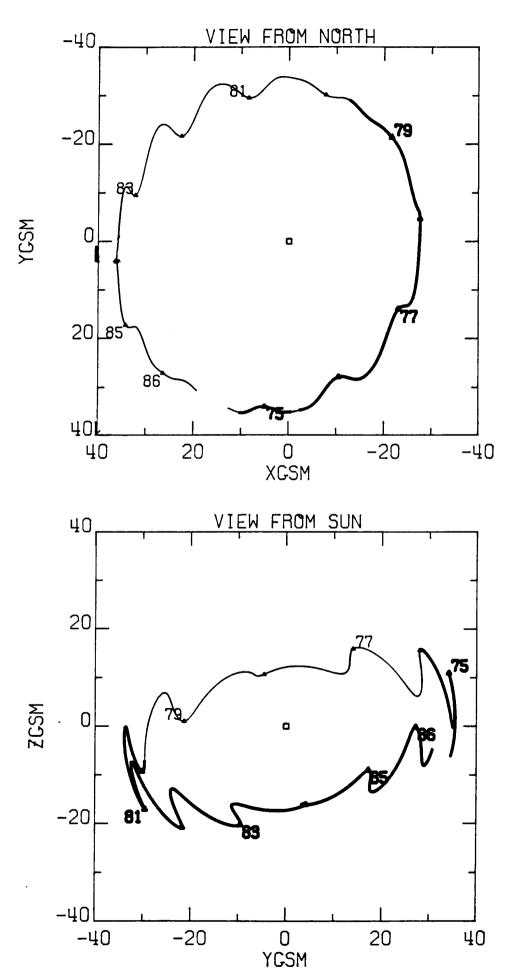


IMP 7 TRAJECTORY. ASCENDING NODE 104 FROM MAR 2 TO MAR 14 1976 DAYS 62 THRU

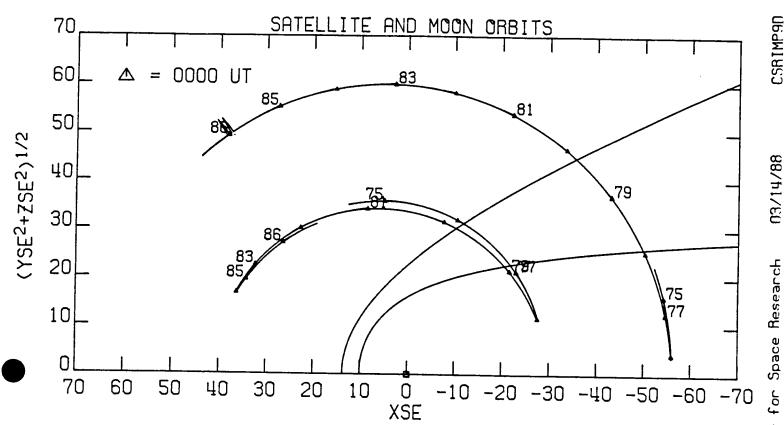


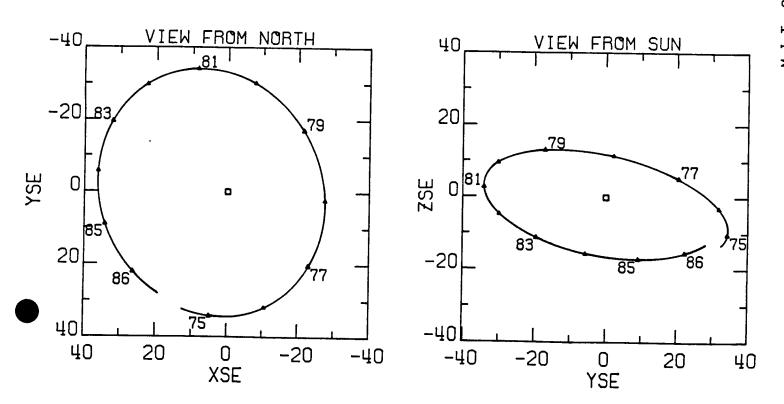


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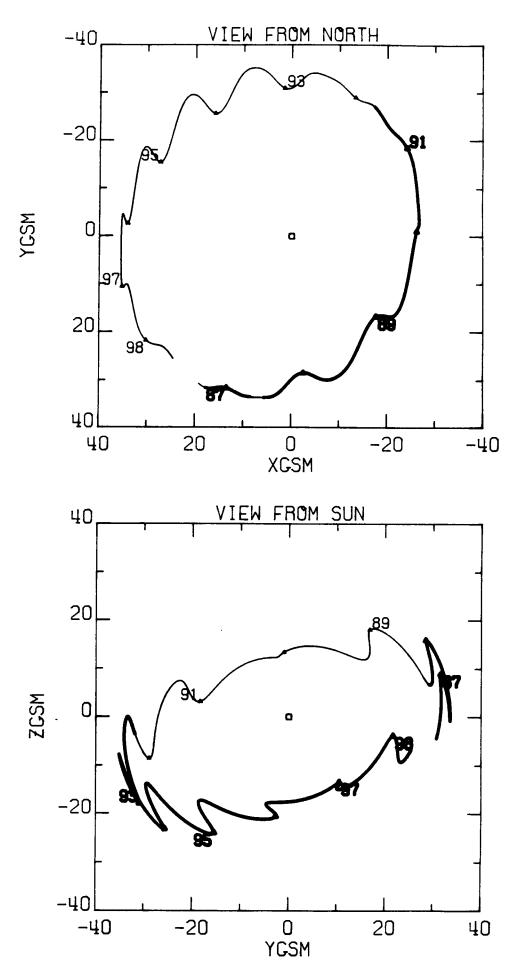


IMP 7 TRAJECTORY. ASCENDING NODE 105 FROM MAR 14 TO MAR 26 1976 DAYS 74 THRU 86

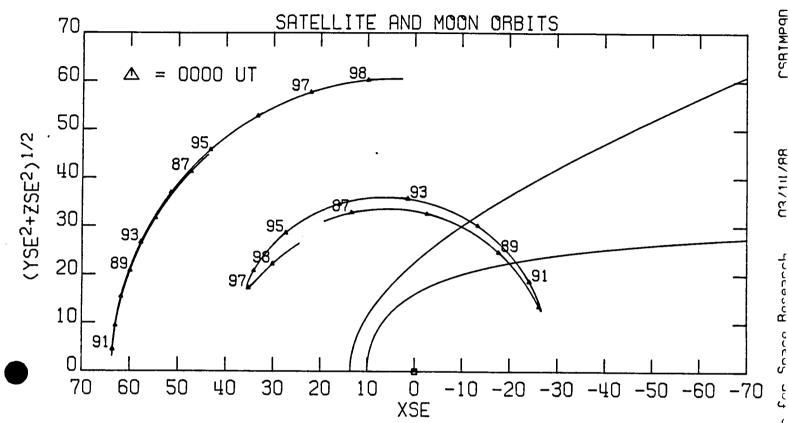


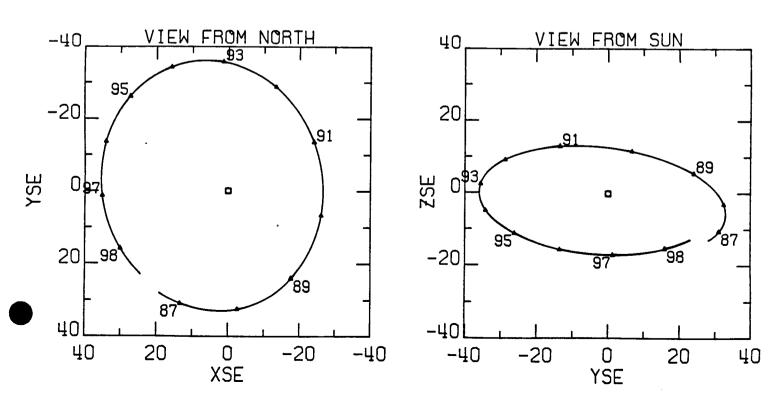


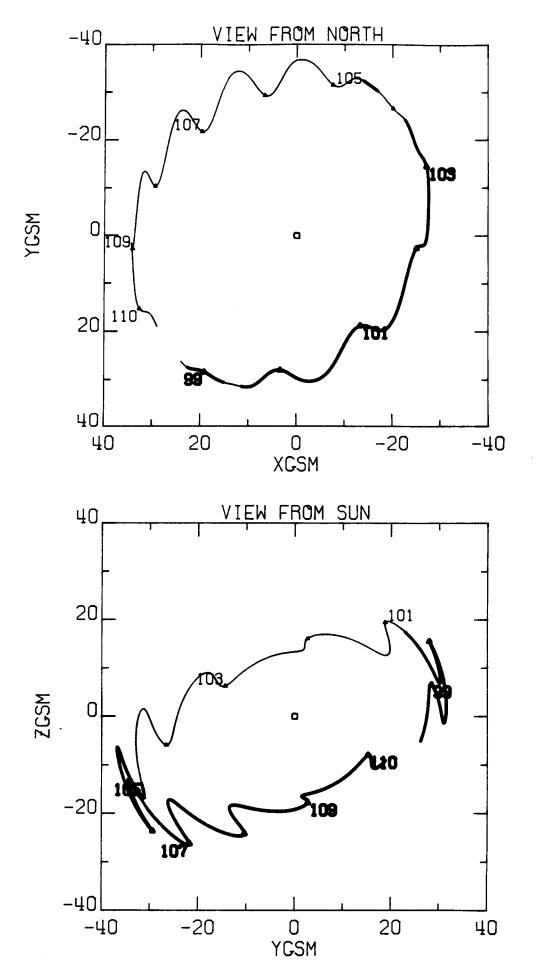
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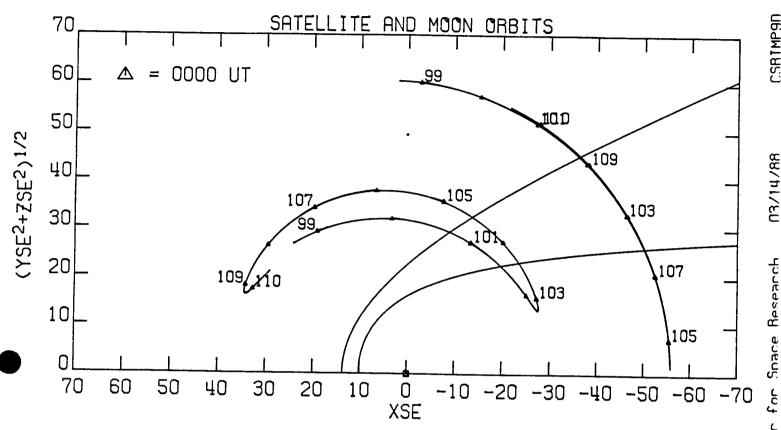
IMP 7 TRAJECTORY. ASCENDING NODE 106 FROM MAR 26 TO APR 1976 DAYS 86 THRU 98

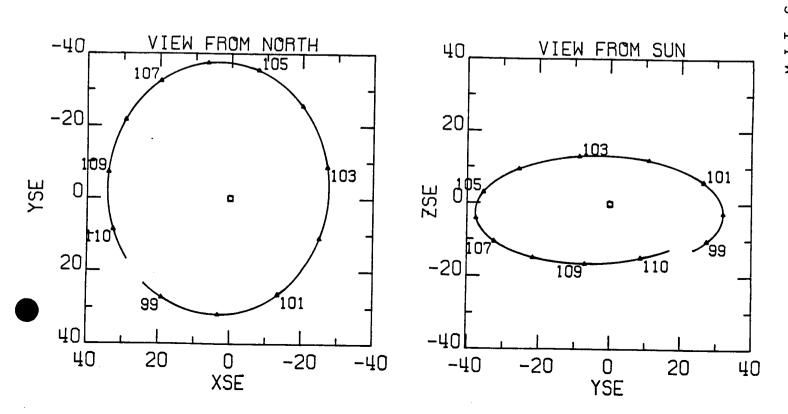




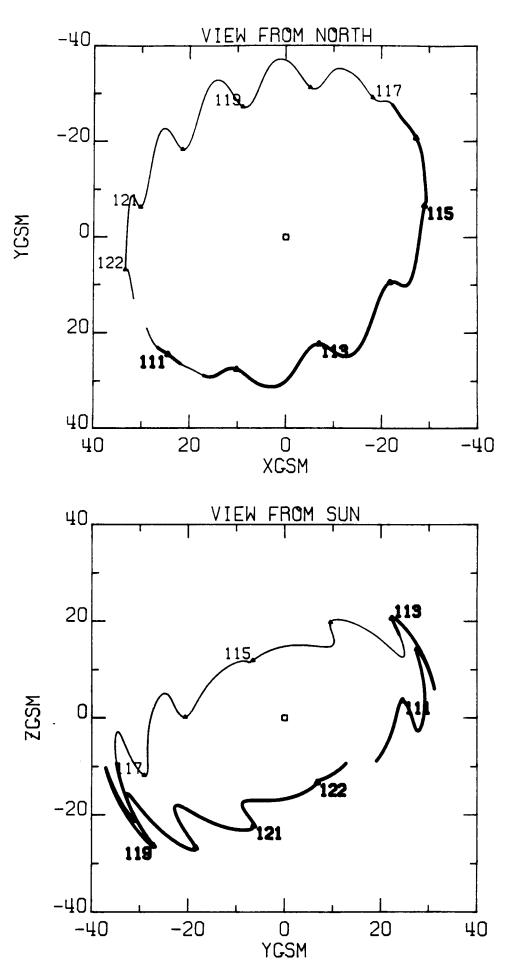


IMP 7 TRAJECTORY. ASCENDING NODE 107 FROM APR 7 TO APR 19 1976 DAYS 98 **THRU** 110

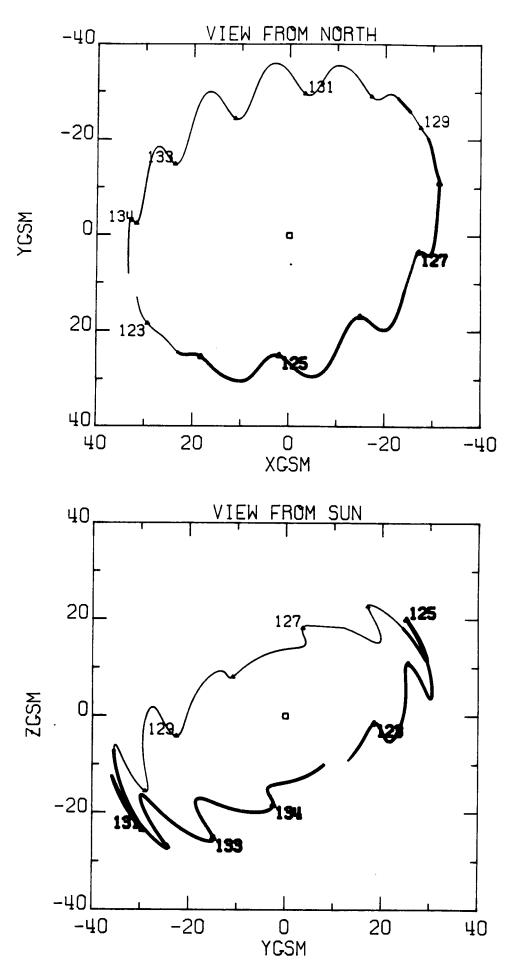




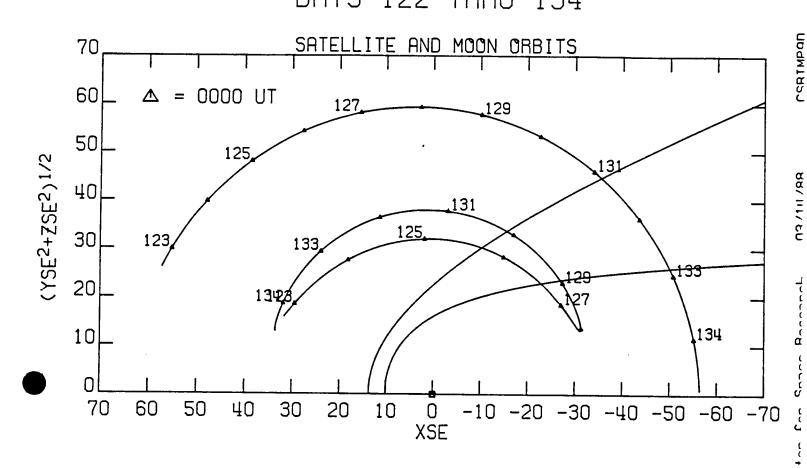
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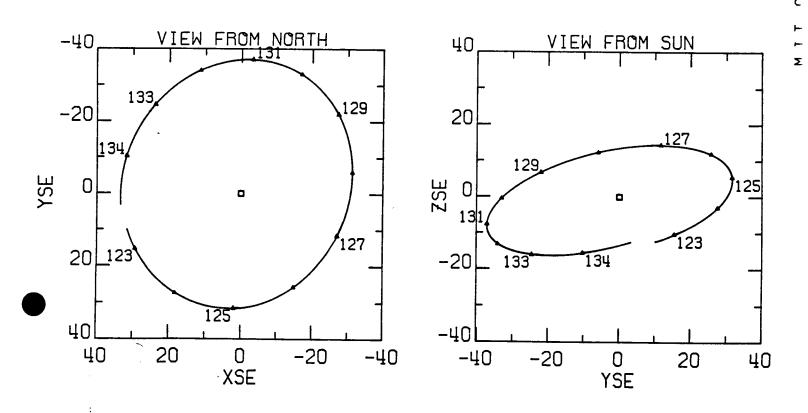


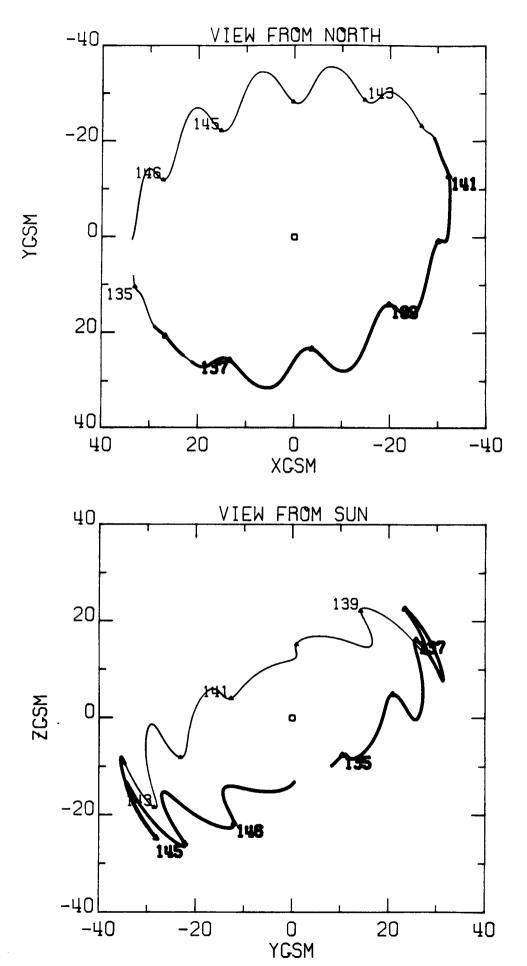
IMP 7 TRAJECTORY. ASCENDING NODE 108 TO MAY FROM APR 19 DAYS THRU **CSRIMPON** SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 03/111/RB 122/ O XSE -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 T21 YSE **ZSE** -20 -40 XSE -20 O YSE -20 -40 -40 



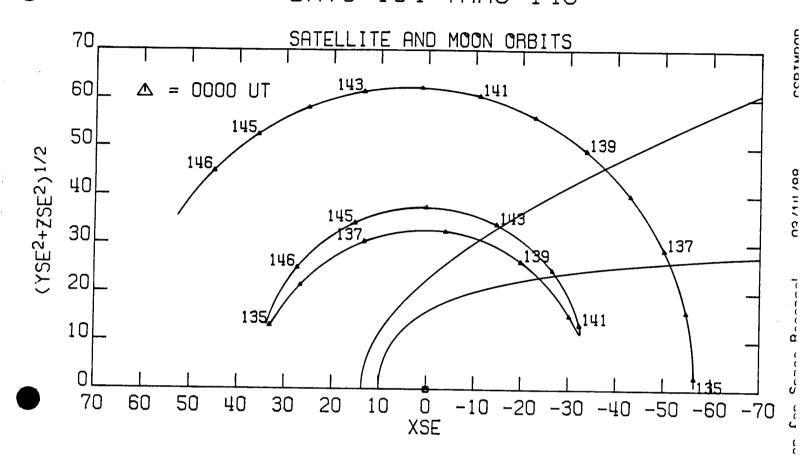
IMP 7 TRAJECTORY. ASCENDING NODE 109
FROM MAY 1 TO MAY 13 1976
DAYS 122 THRU 134

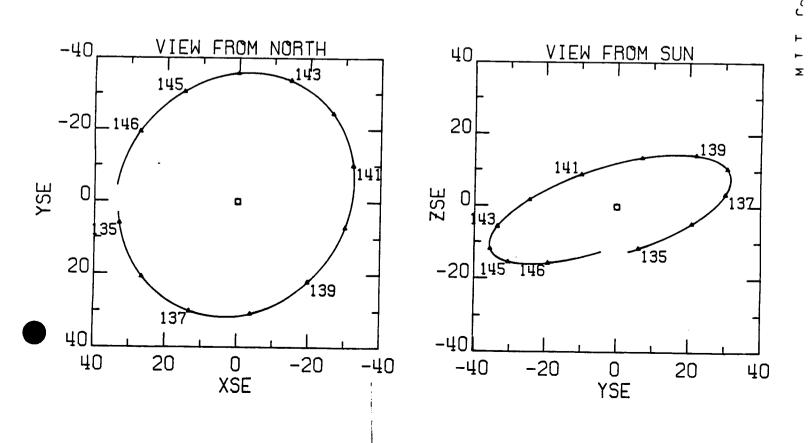


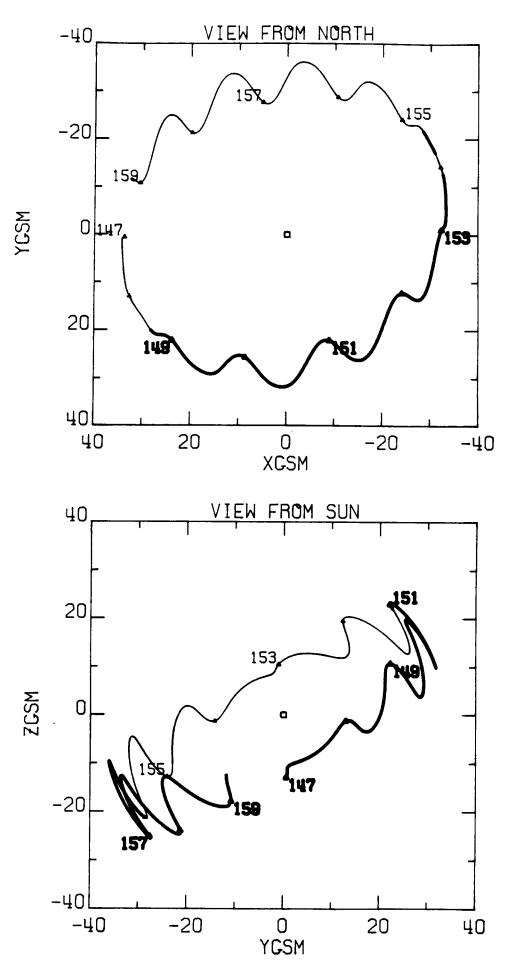




IMP 7 TRAJECTORY. ASCENDING NODE 110
FROM MAY 13 TO MAY 25 1976
DAYS 134 THRU 146

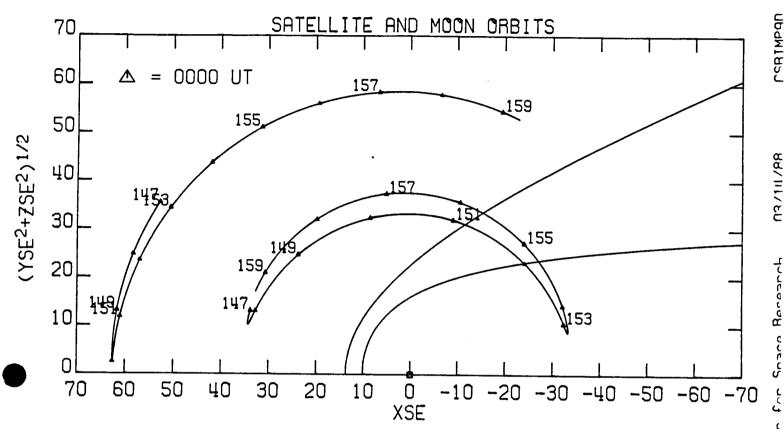


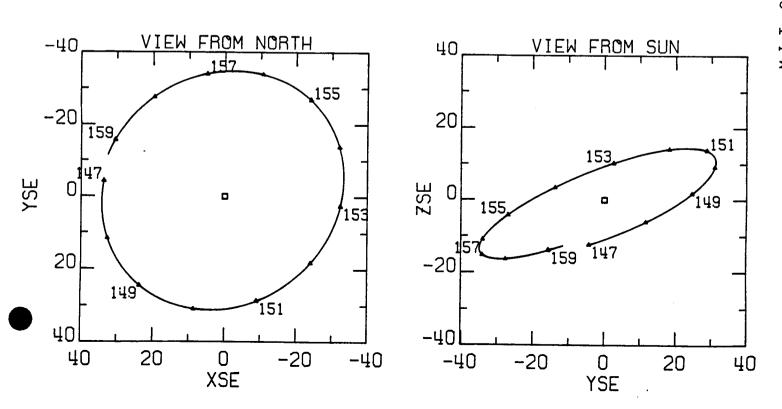




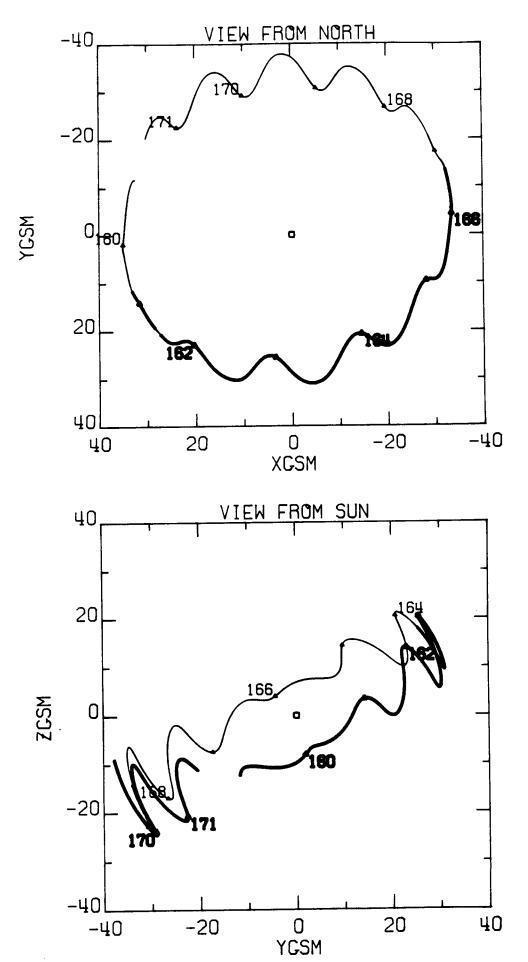
7 TRAJECTORY. ASCENDING NODE 111 IMP

FROM MAY 25 TO JUN 1976 DAYS 146 THRU

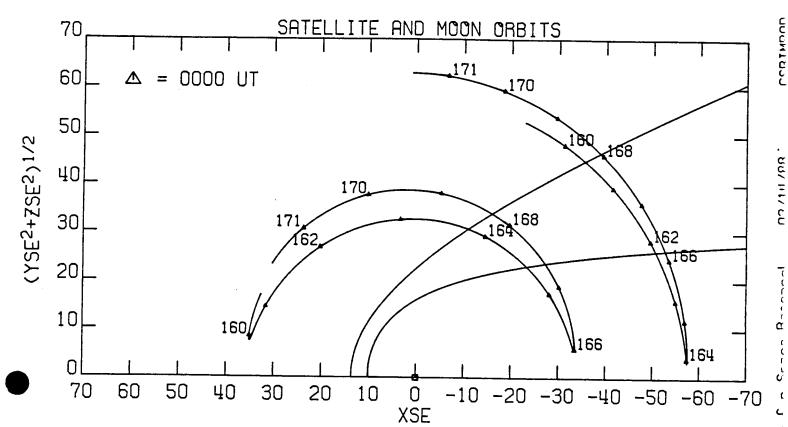


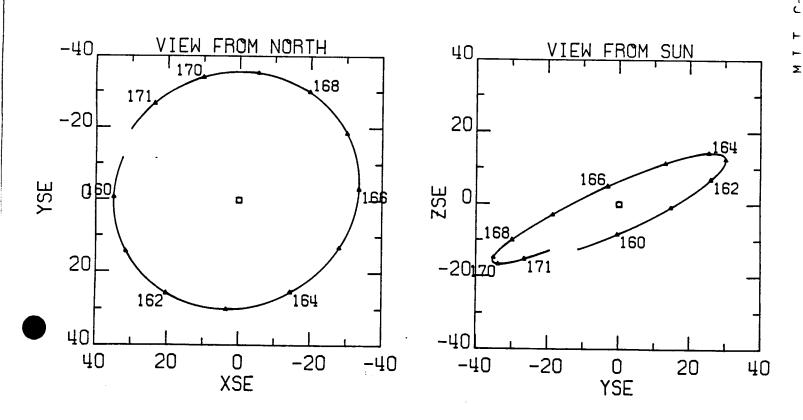


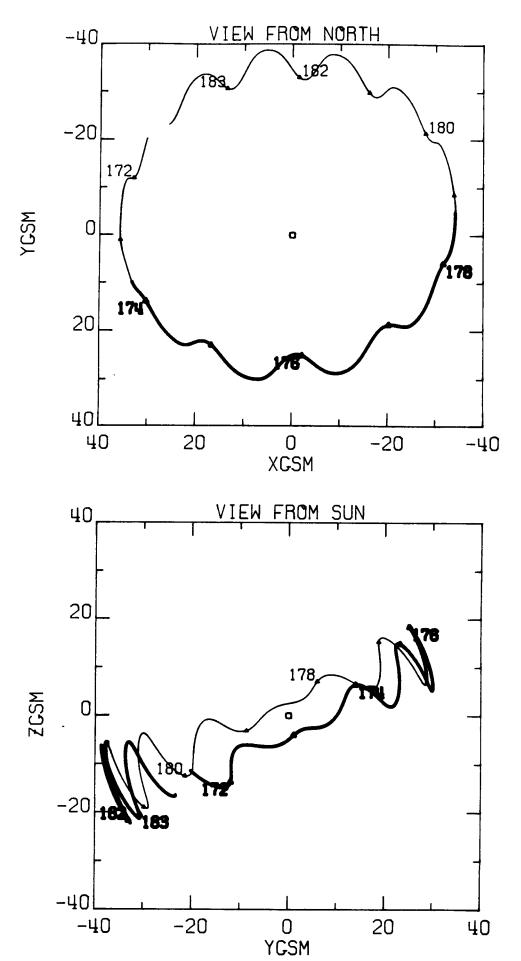
Pantan for Snara Ranaanch



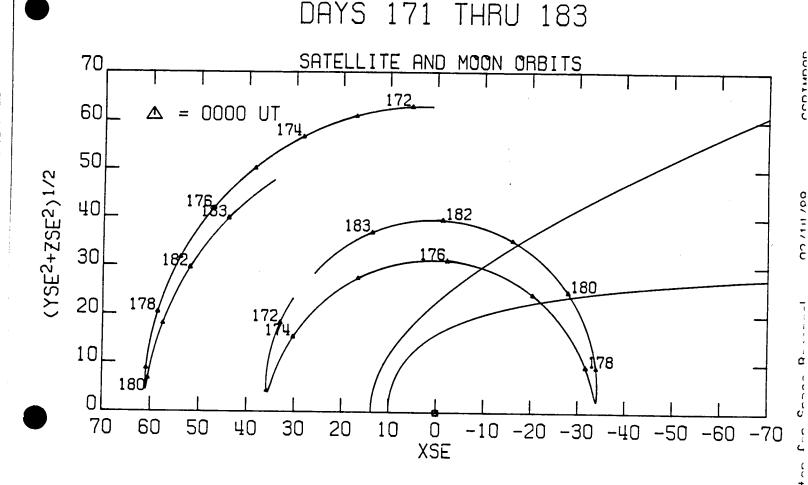
IMP 7 TRAJECTORY. ASCENDING NODE 112 FROM JUN 7 TO JUN 19 1976 DAYS 159 THRU

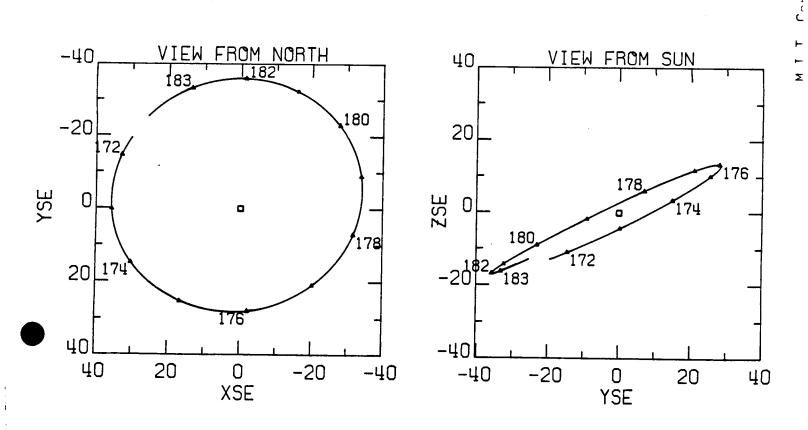


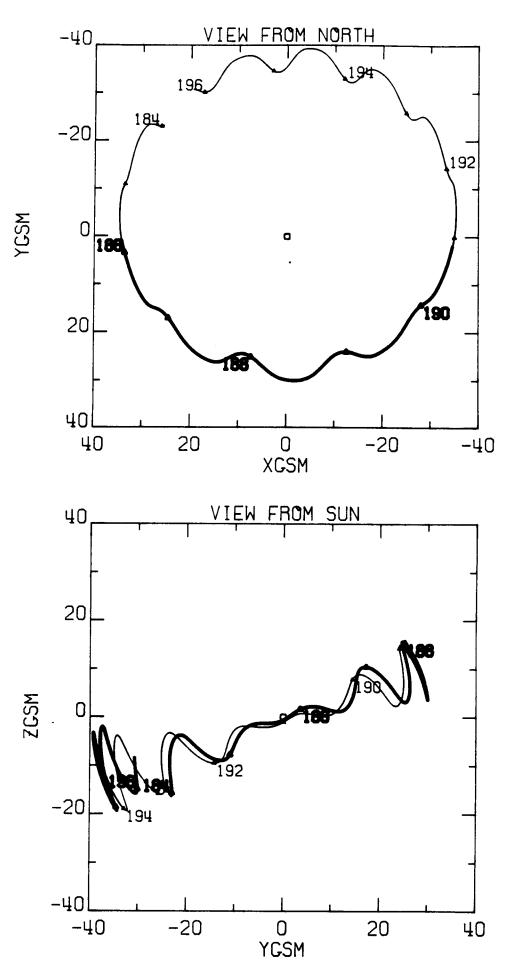




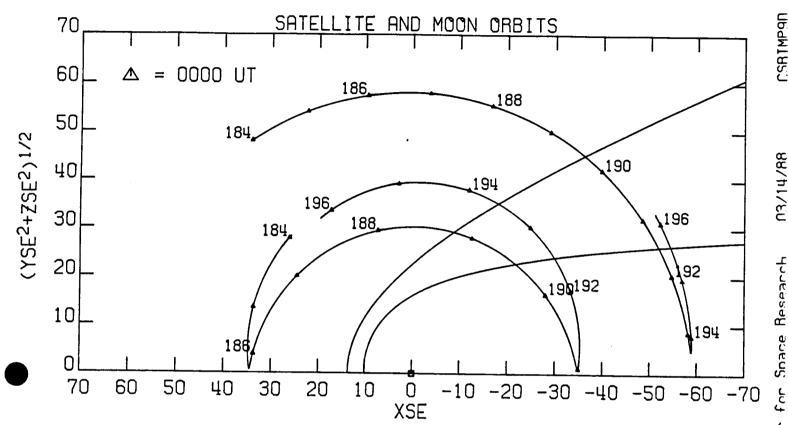
IMP 7 TRAJECTORY. ASCENDING NODE 113
FROM JUN 19 TO JUL 1 1976
DAYS 171 THRU 183

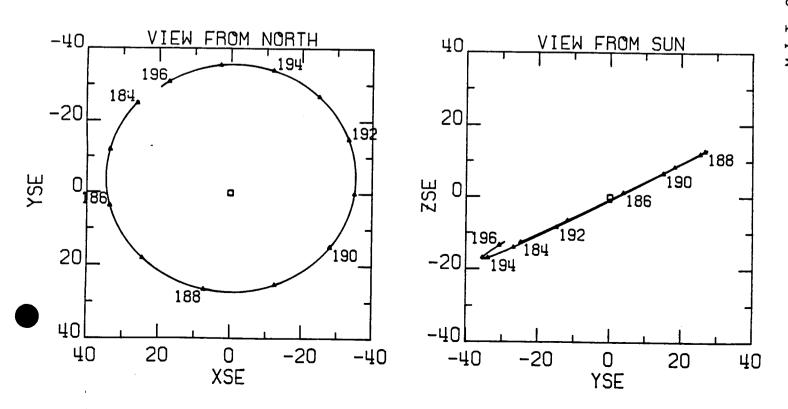




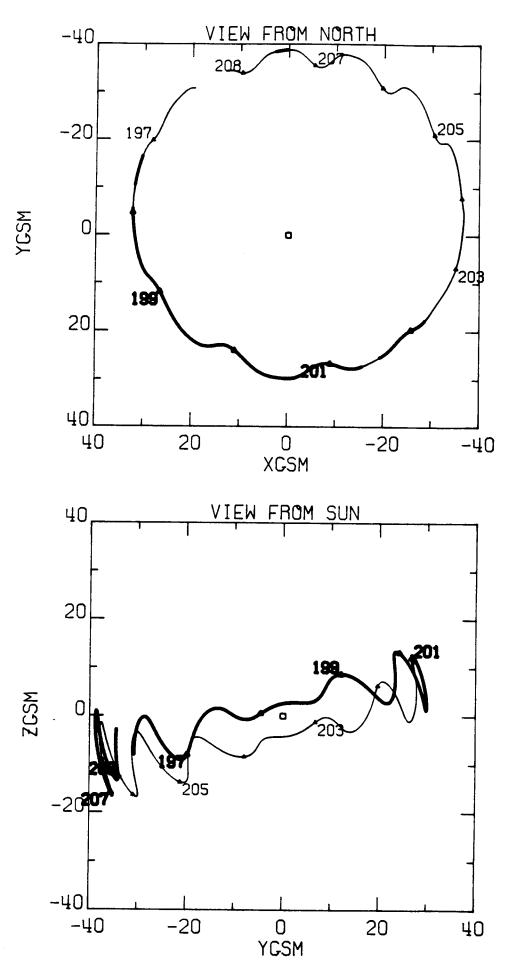


IMP 7 TRAJECTORY. ASCENDING NODE 114 FROM JUL 1 TO JUL 14 1976 183 DAYS THRU

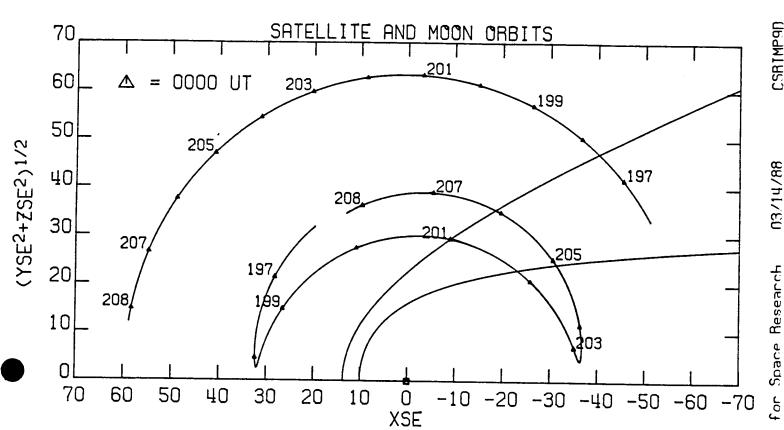


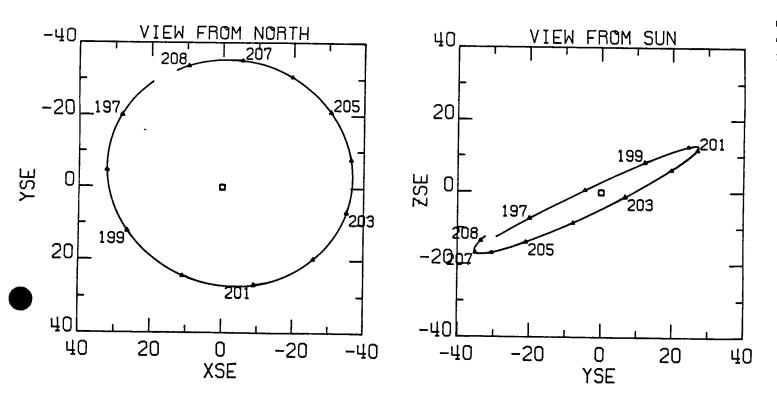


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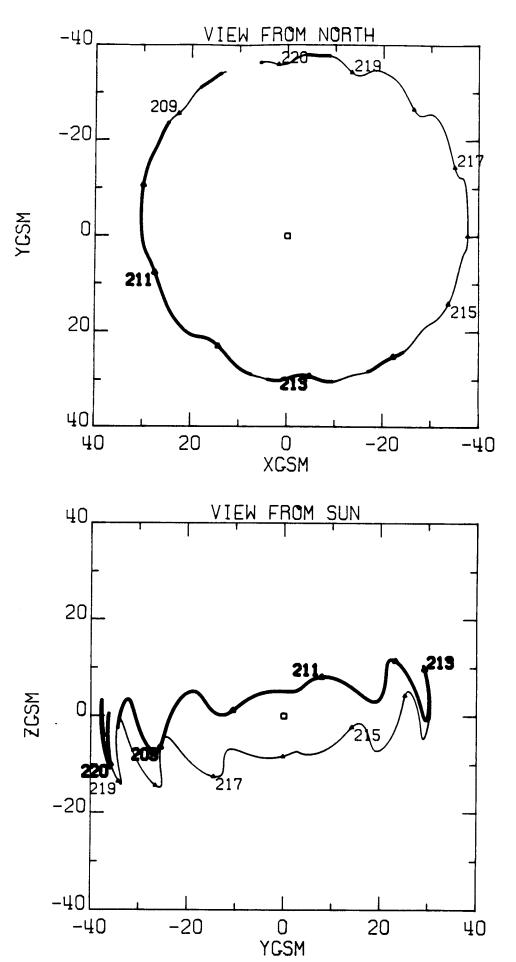


IMP 7 TRAJECTORY. ASCENDING NODE 115 FROM JUL 14 TO JUL 26 1976 DAYS 196 THRU 208



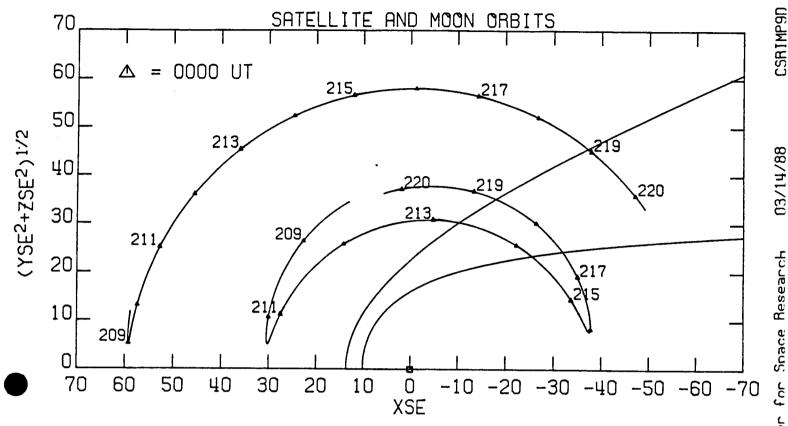


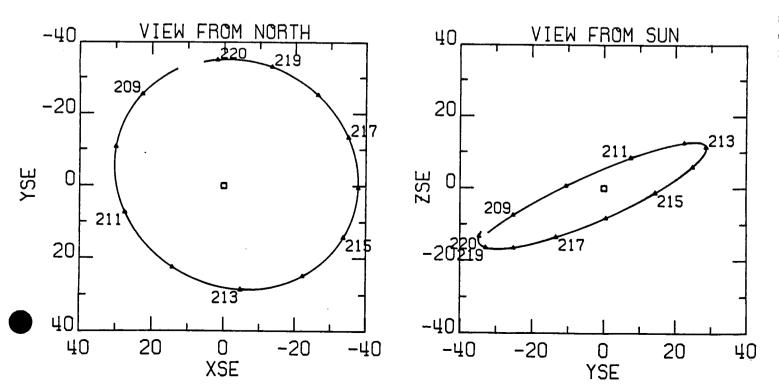
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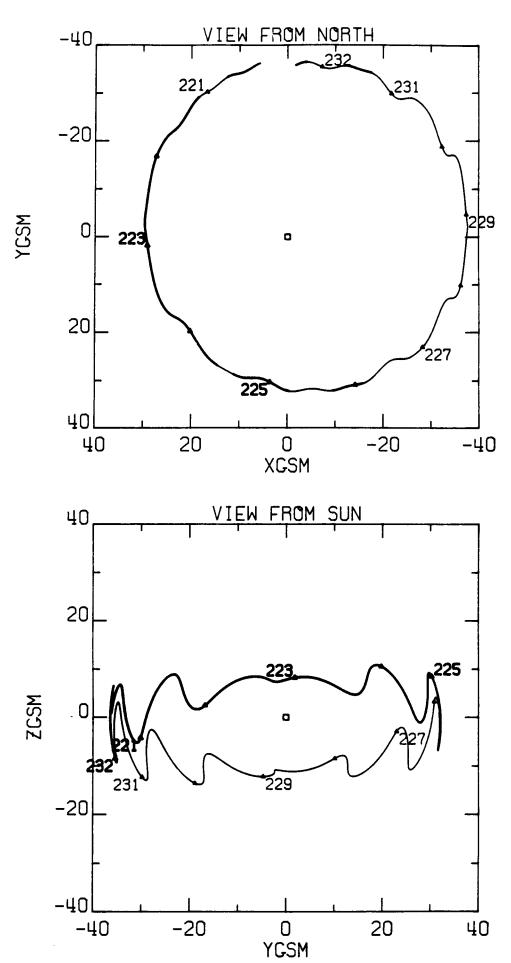
7 TRAJECTORY. ASCENDING NODE 116

> FROM JUL 26 TO AUG 7 DAYS 208 THRU 220





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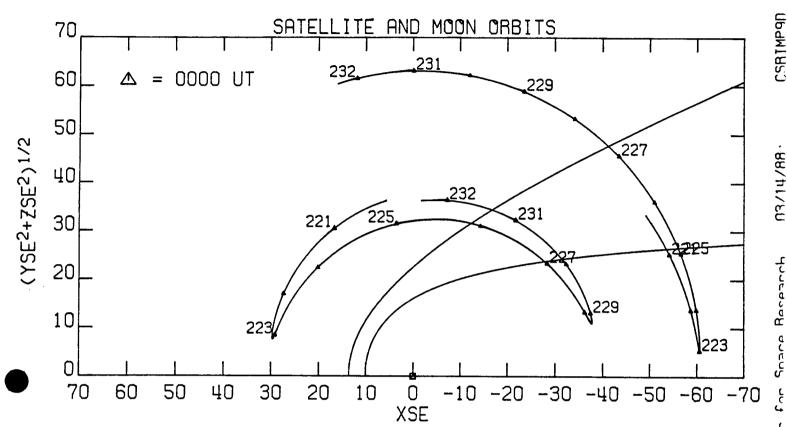
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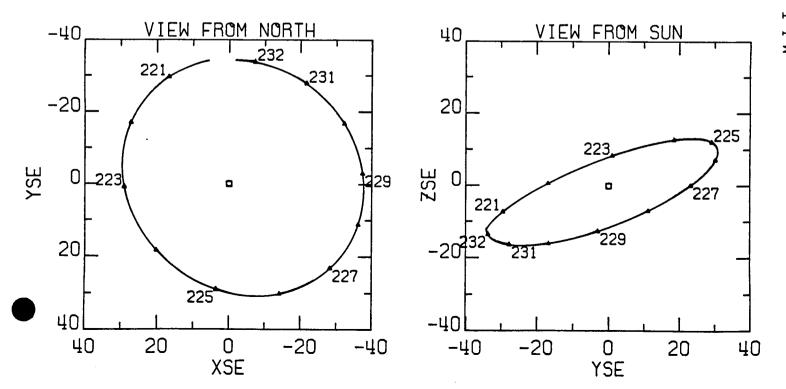
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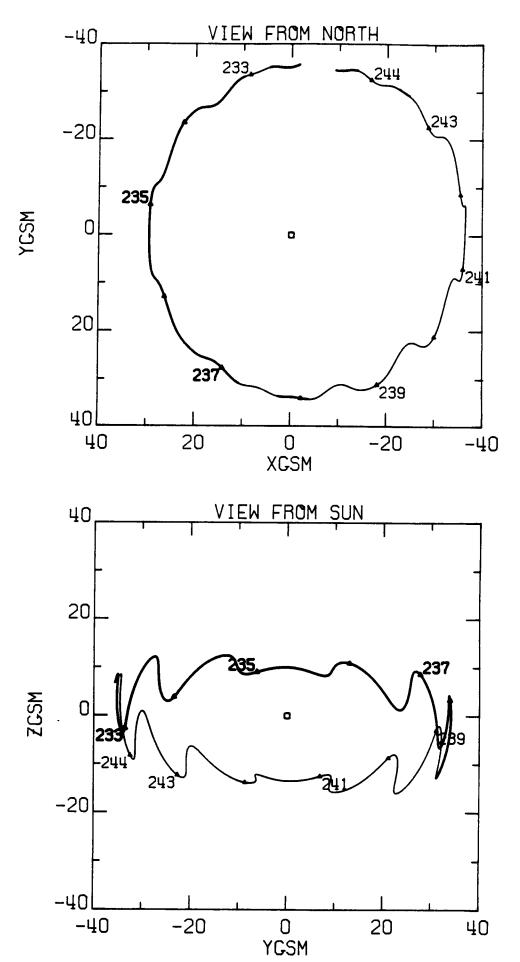
2

7 TRAJECTORY. IMP ASCENDING NODE 117 FROM AUG 7 TO AUG 19 1976 DAYS 220 THRU 232





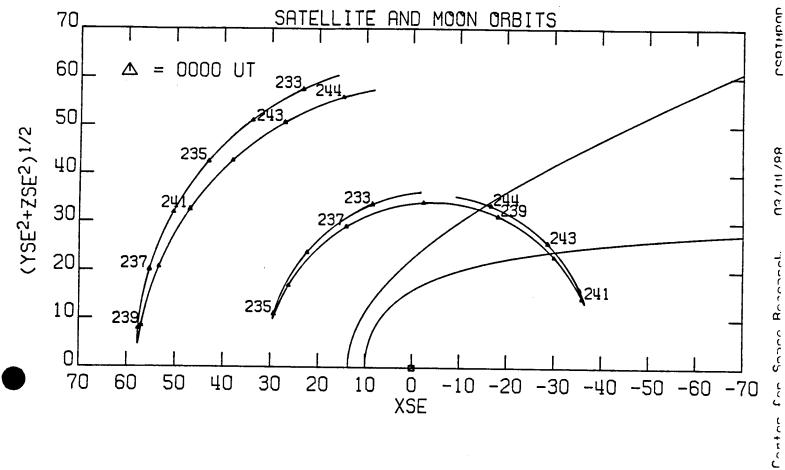
Parter for Snare Research

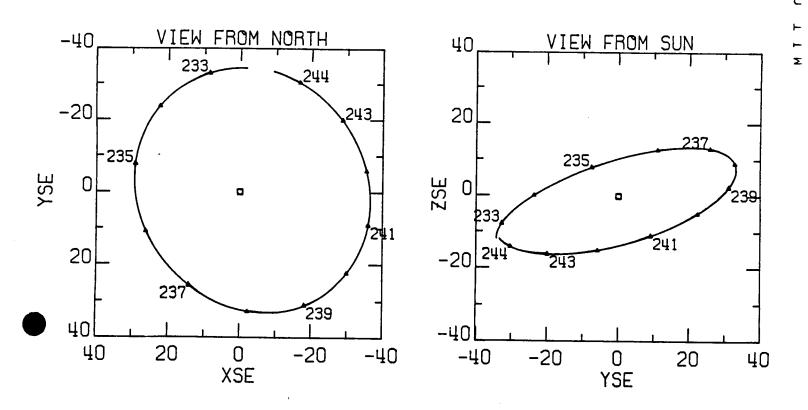


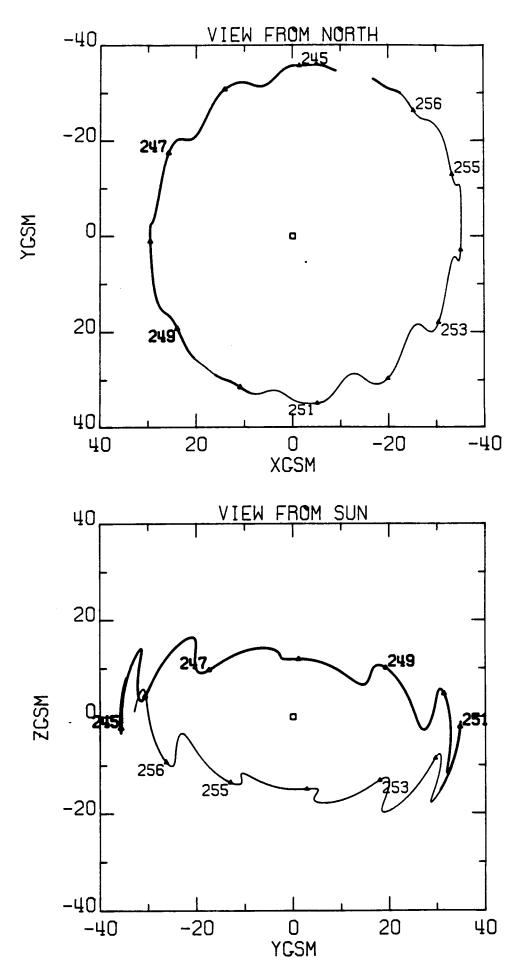
IMP 7 TRAJECTORY. ASCENDING NODE 118

FROM AUG 19 TO AUG 31 1976

DAYS 232 THRU 244

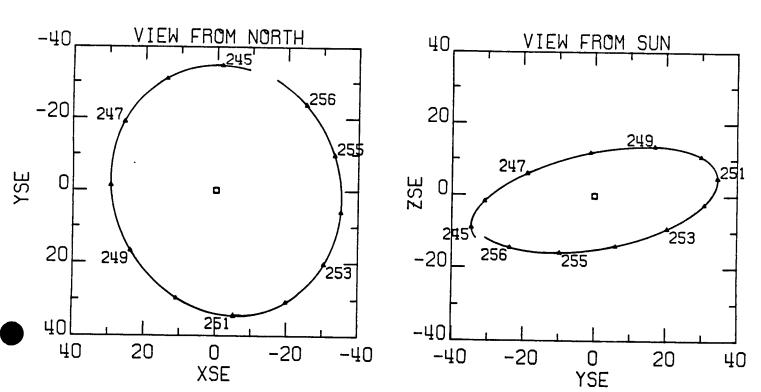


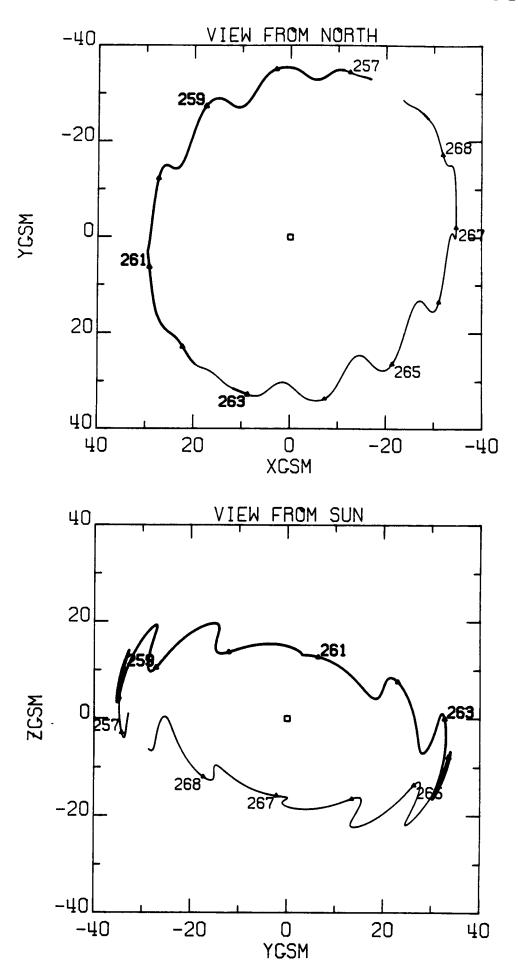




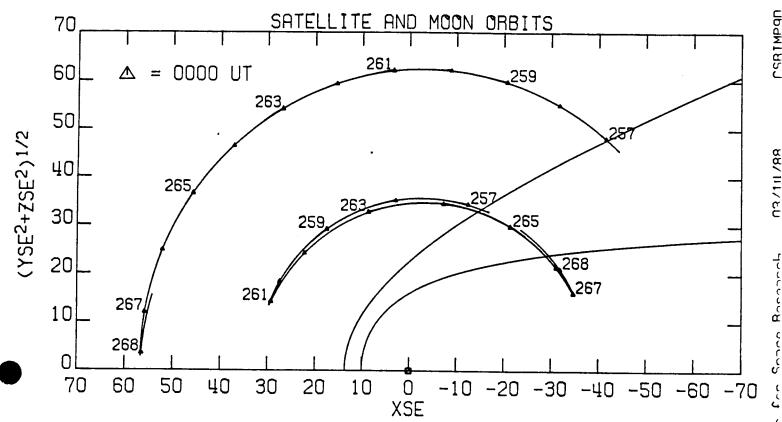
IMP 7 TRAJECTORY. ASCENDING NODE 119 FROM AUG 31 TO SEP 12 1976 DAYS 244 THRU 256 SATELLITE AND MOON ORBITS CSRIMPON = 0000 UT 24,9256 <del>253</del> 255 Pontor for Snare Recearch -10 -20 -30 -40 -50 -60 -70 XSE VIEW FROM NORTH VIEW FROM SUN 

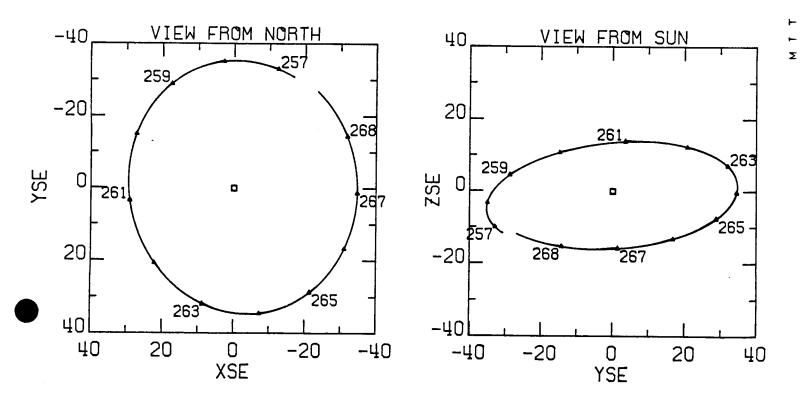
(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2



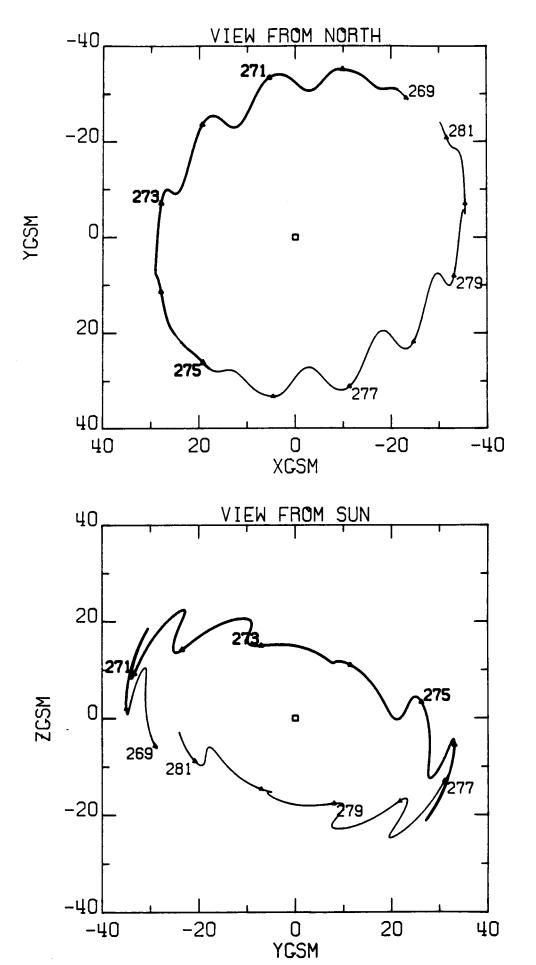


IMP 7 TRAJECTORY. ASCENDING NODE 120 FROM SEP 12 TO SEP 24 1976 DAYS 256 THRU 268





Racasach



TRAJECTORY. ASCENDING NODE 121 FROM SEP 24 TO OCT 1976 DAYS 268 THRU 281 **CSRIMP90** SATELLITE AND MOON ORBITS 70 60 0000 UT 275 273 277 50 03/14/88 40 271 279 30 269 <del>281</del> \279 M.I.T. Center for Space Research 20 273 269 281 10 70 60 50 30 Ö XSE 40 20 10 -30 -10 -20 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 269 -20 20 **\281** 273 273 275 **ZSE** 0 02[7 269 281 20 -20 279 275 277 40 -40

-40

-20

O YSE

20

40

(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2

YSE

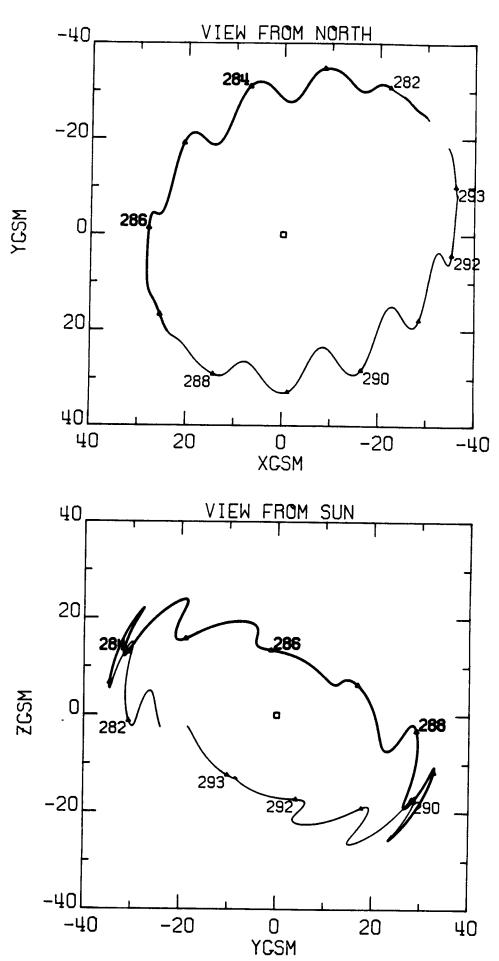
40

20

O XSE

-20

-40

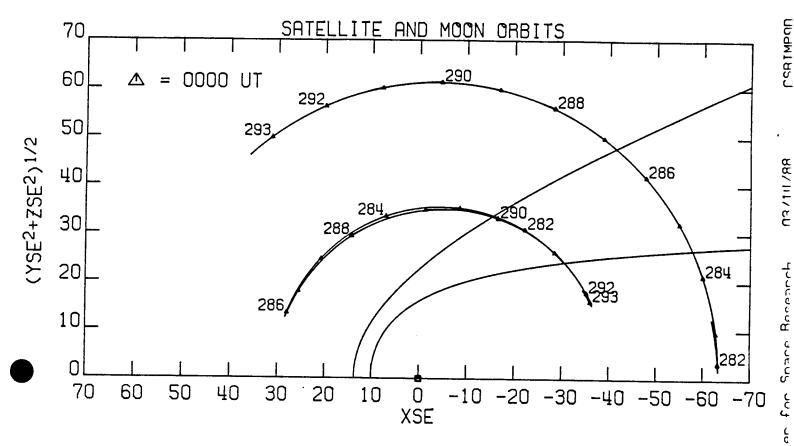


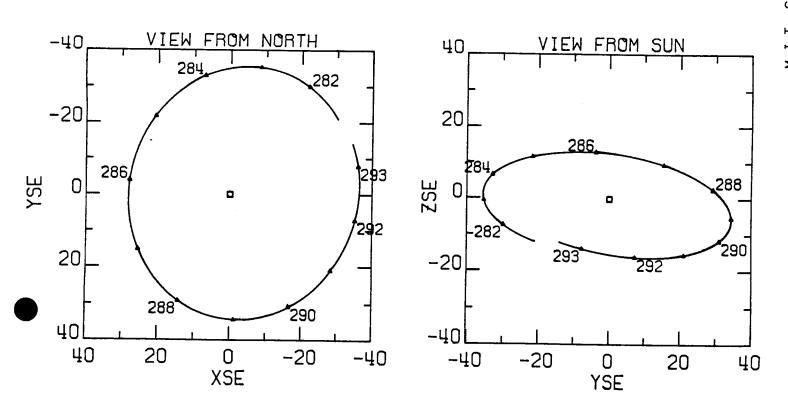
00/11/00

-

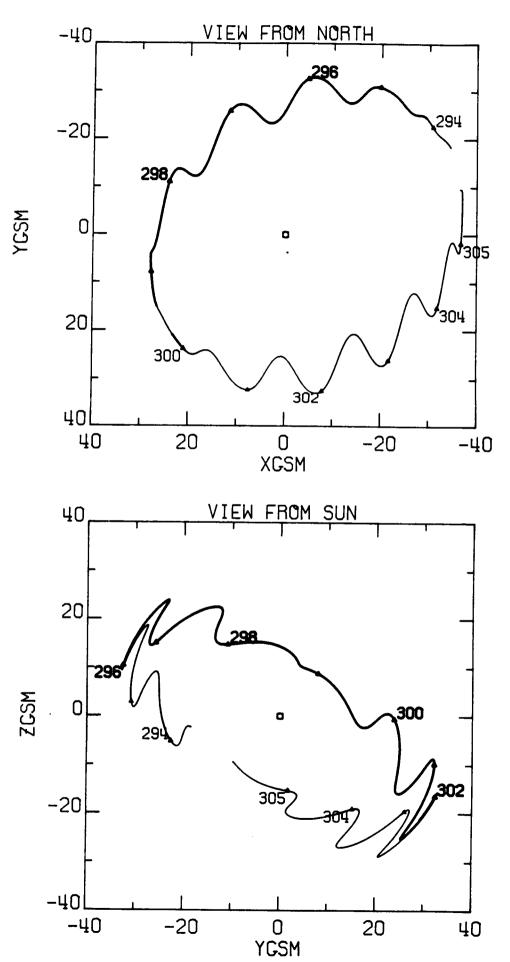
Conton Lo

. ≥ IMP 7 TRAJECTORY. ASCENDING NODE 122 FROM OCT TO OCT 19 1976 DAYS 281 THRU



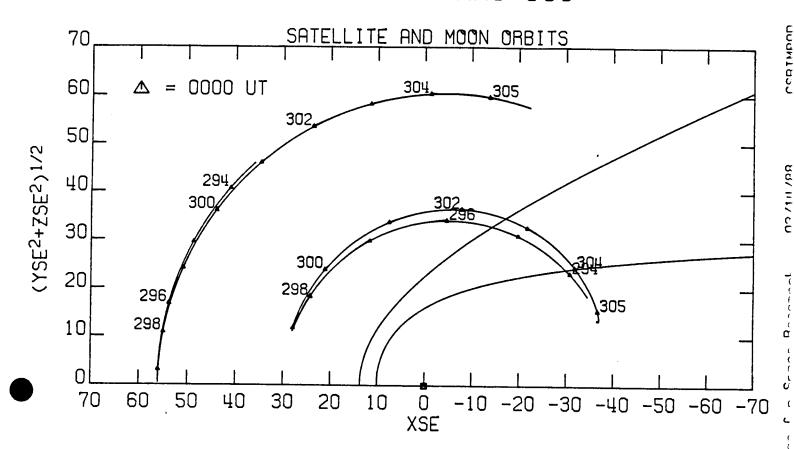


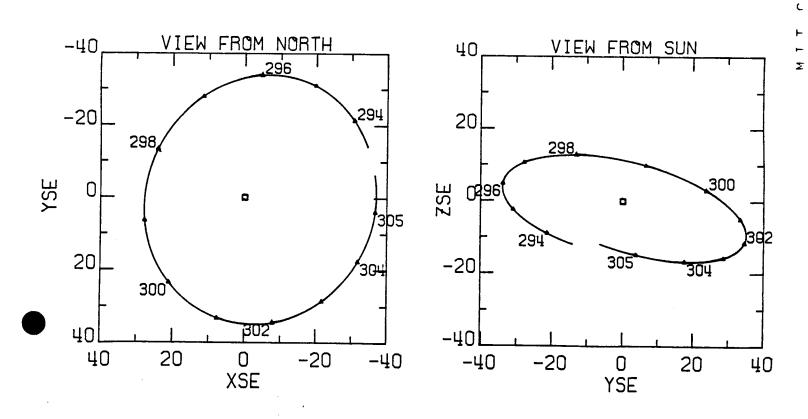
M. I. T. Conton for Snace Becearch

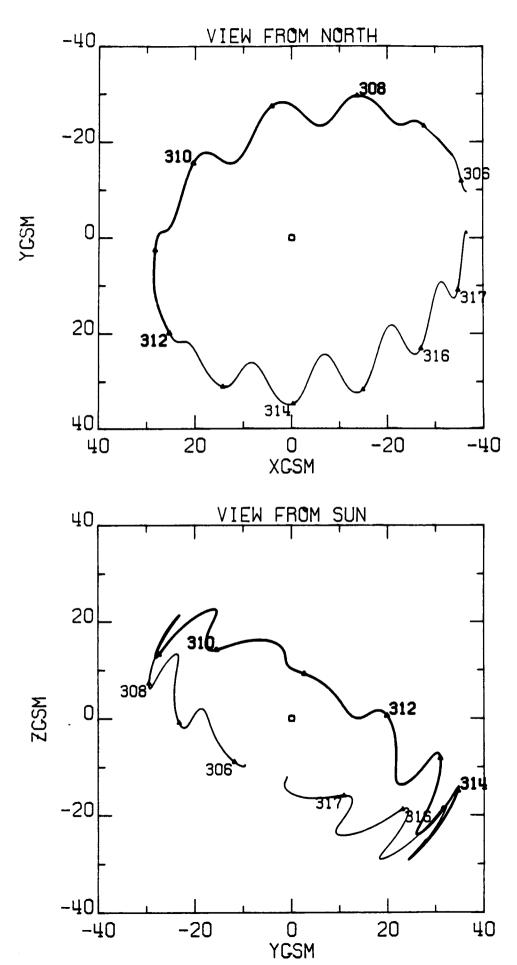


IMP 7 TRAJECTORY. ASCENDING NODE 123

FROM OCT 19 TO OCT 31 1976
DAYS 293 THRU 305

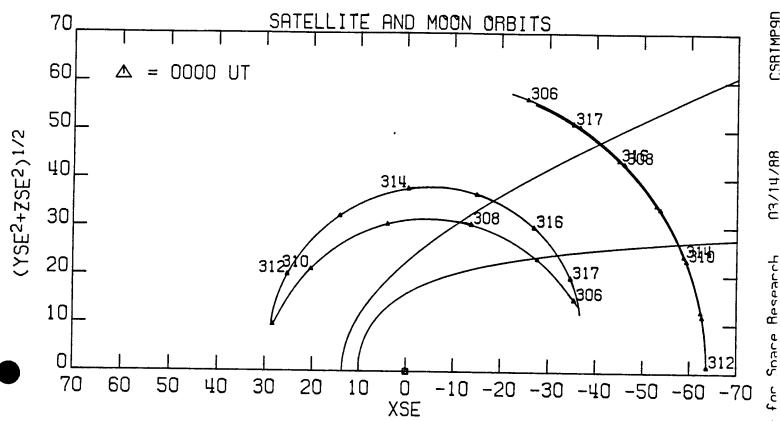


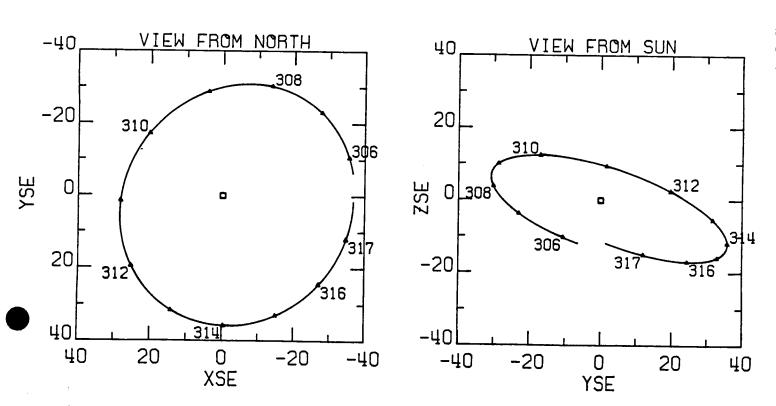




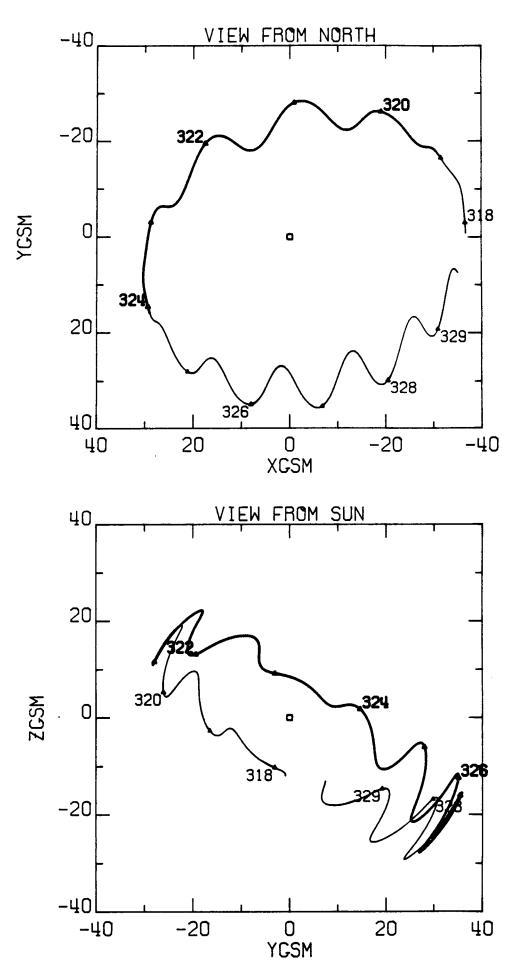
IMP 7 TRAJECTORY. ASCENDING NODE 124

> FROM OCT 31 TO NOV 12 1976 DAYS 305 THRU 317

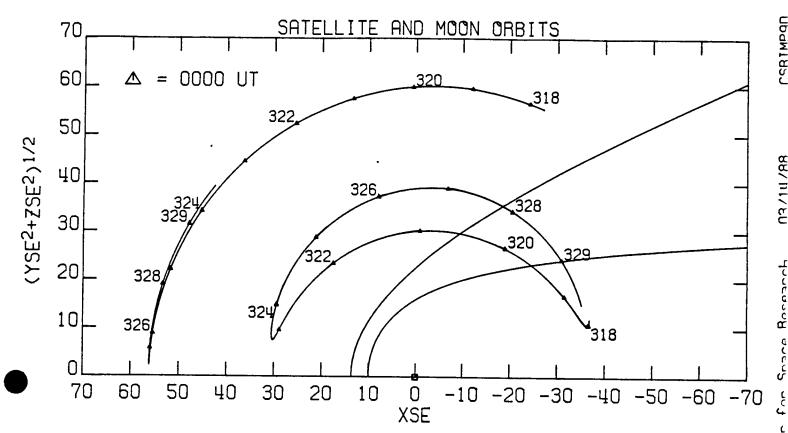


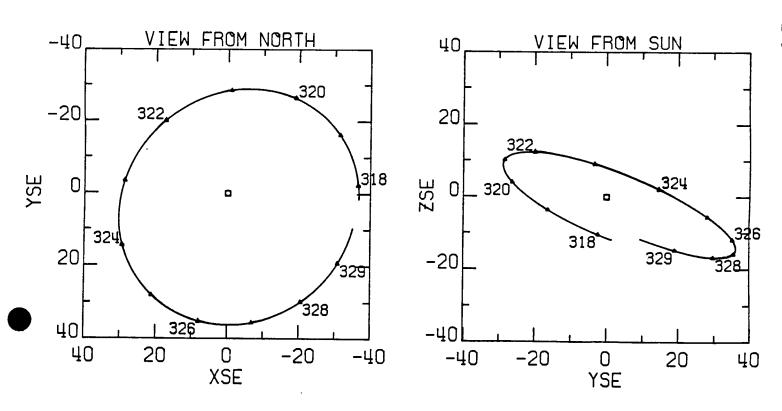


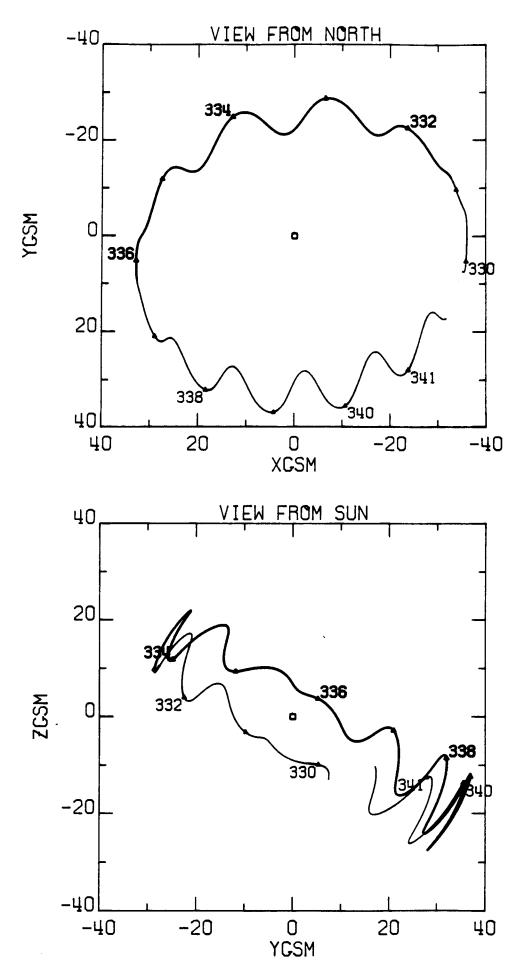
Panter for Snare Research



IMP 7 TRAJECTORY. ASCENDING NODE 125 FROM NOV 12 TO NOV 24 1976 DAYS 317 THRU 329

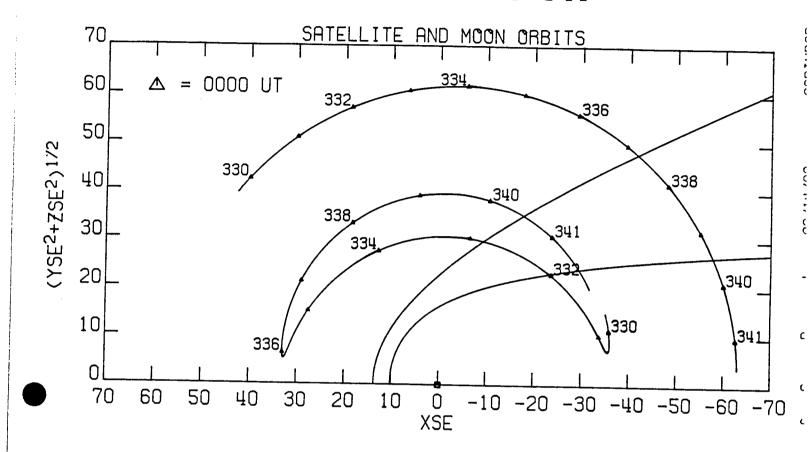


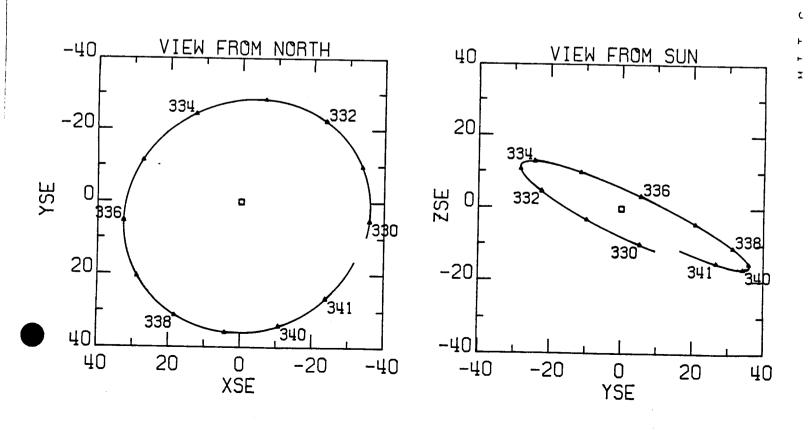


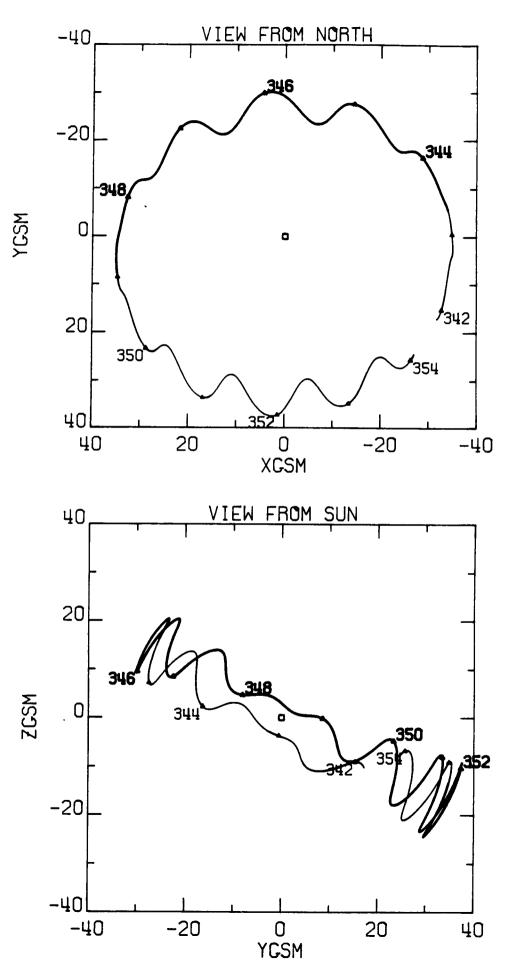


IMP 7 TRAJECTORY. ASCENDING NODE 126

FROM NOV 24 TO DEC 6 1976 DAYS 329 THRU 341

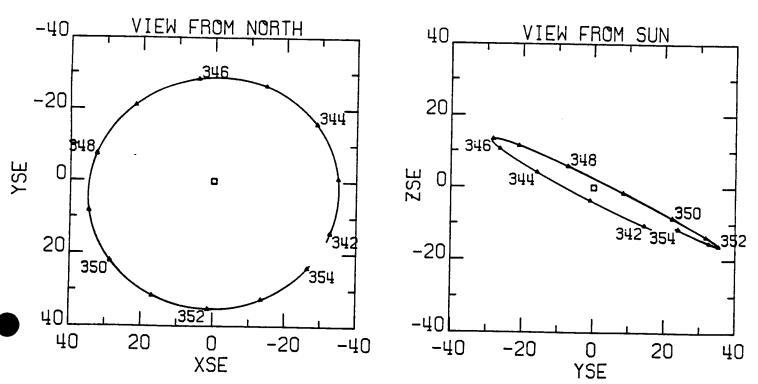


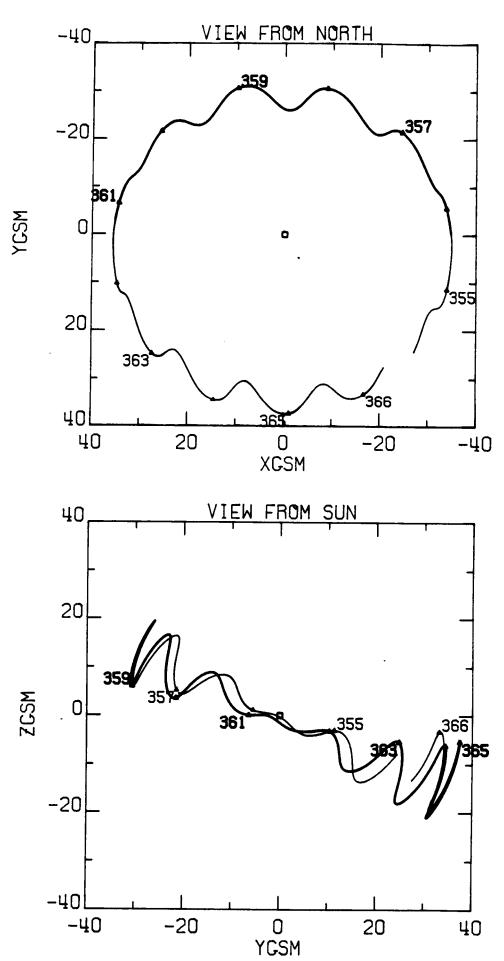




IMM 7 THHULCIUHY. ASCENDING NODE 127 FROM DEC 6 TO DEC DAYS 341 THRU 354 SATELLITE AND MOON ORBITS = 0000 UT 54 31/342 XSE -40 -10 -20 -30 -50 -60 -70

(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2

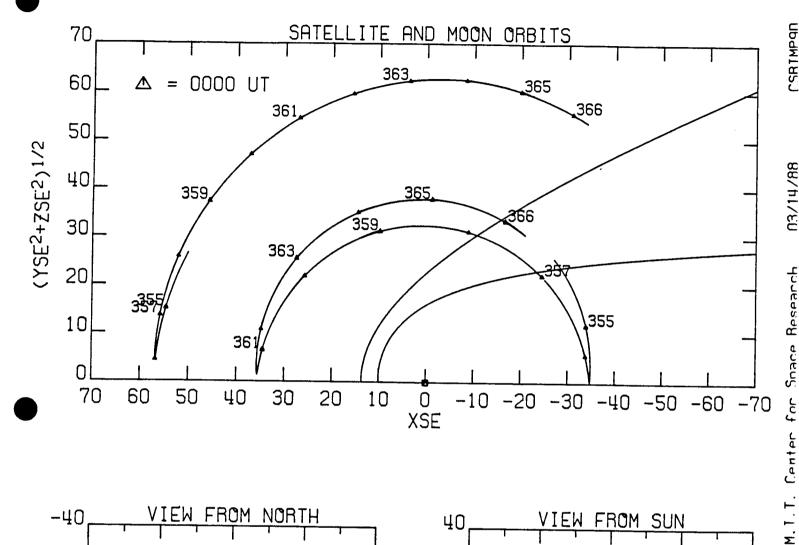


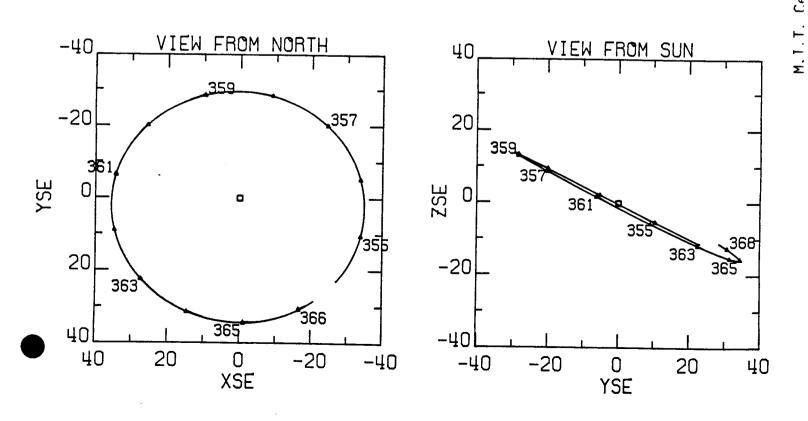


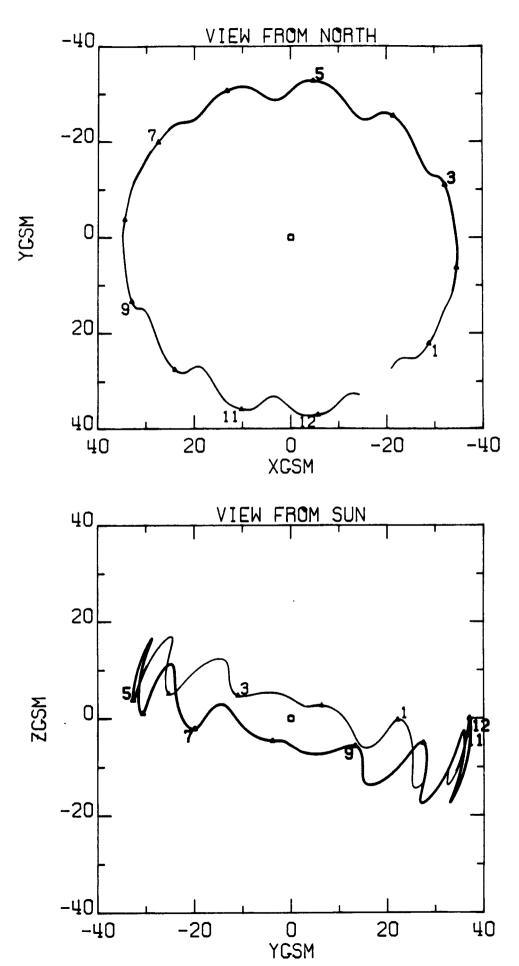
IMP / IMHULLIUMI. ASCENDING NODE 128

FROM DEC 19 TO DEC 31 1976

DAYS 354 THRU 366







IMP 7 TRAJECTORY. ASCENDING NODE 129 FROM DEC 31 TO JAN 12 1977 DAYS 366 THRU 12 70 SATELLITE AND MOON ORBITS 60 = 0000 UT 12 11 50 40 30 20 10 0 60 70 30 50 20 Ö XSE 40 10 -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 -20 20 ZSE 0 0 20 -20

-40

-40

-20

O YSE

20

40

:

40

40

11

20

12

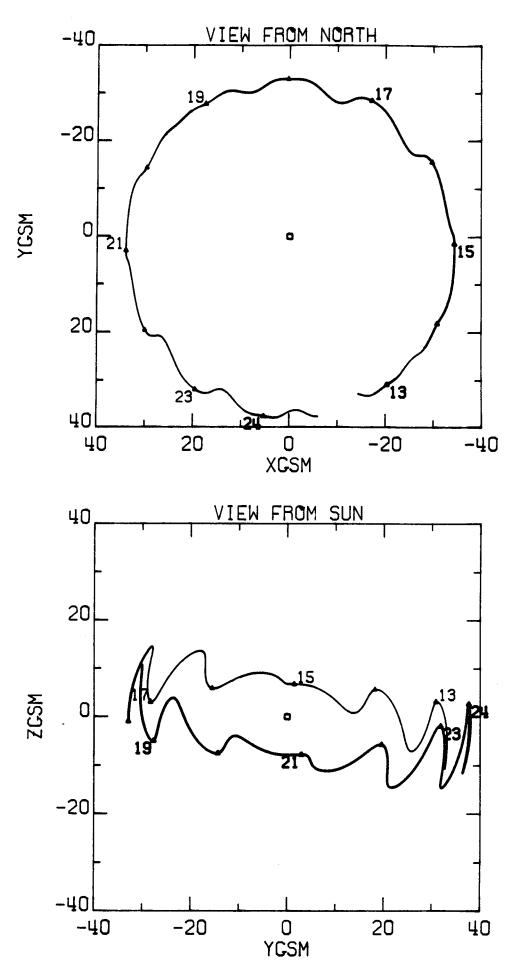
-20

-40

0 XSE

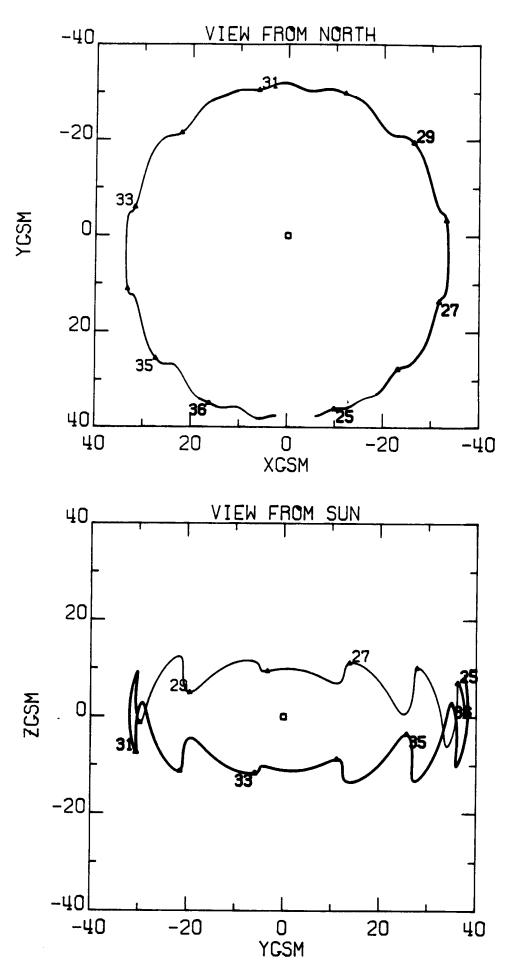
YSE

(YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2

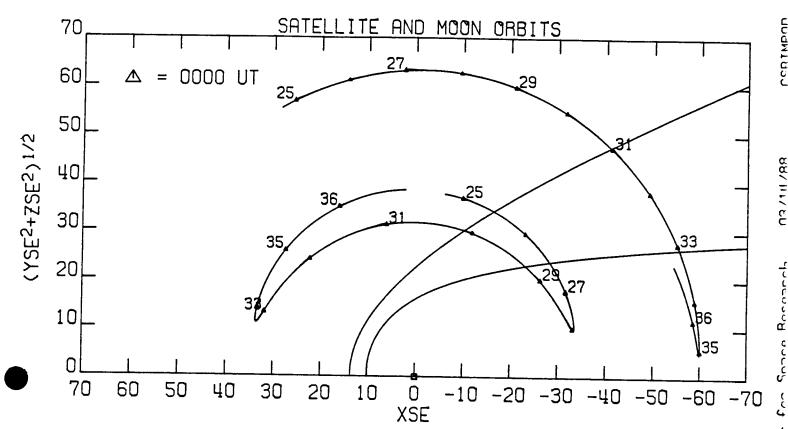


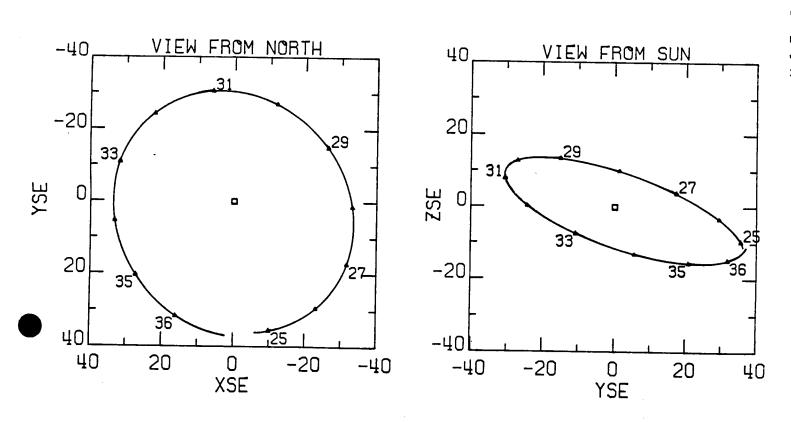
TRAJECTORY. IMP 7 ASCENDING NODE 130 FROM JAN 12 TO JAN 24 1977 DAYS 12 THRU 24 CSRIMPan SATELLITE AND MOON ORBITS 70 60 0000 UT 13 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 N3/14/88 23 40 24 23 30 13 MII Center for Snace Recearch 20 10 **∖**15 50 70 60 Ö XSE 40 30 20 10 -20 -30 -10 -50 -40 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 17 -20 20 15 YSE 0 21 **ZSE** 0 Q 21 20 -20 23 23 13 40 -40 40 0 XSE 20 -20 -20 0 YSE -40 -40 20 40

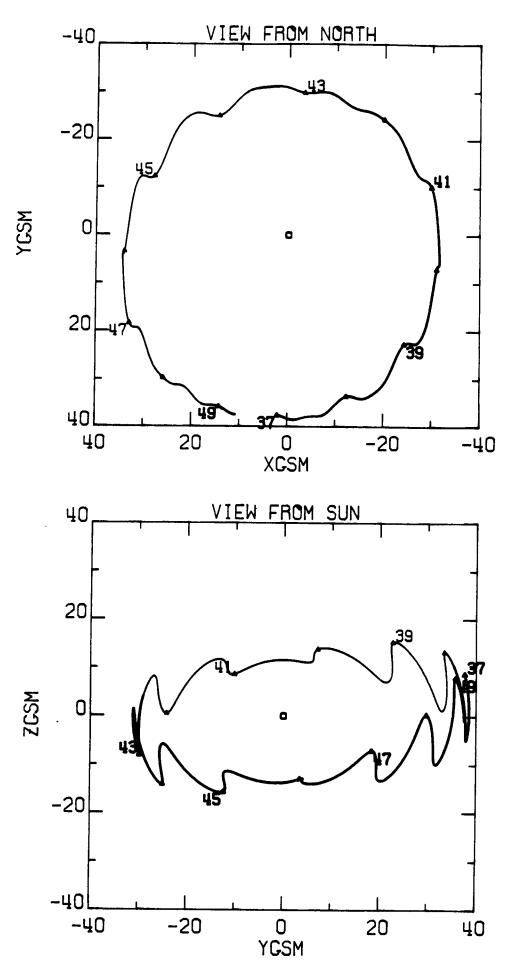
IMP 7 FROM JAN 24 TO FEB 5 1977



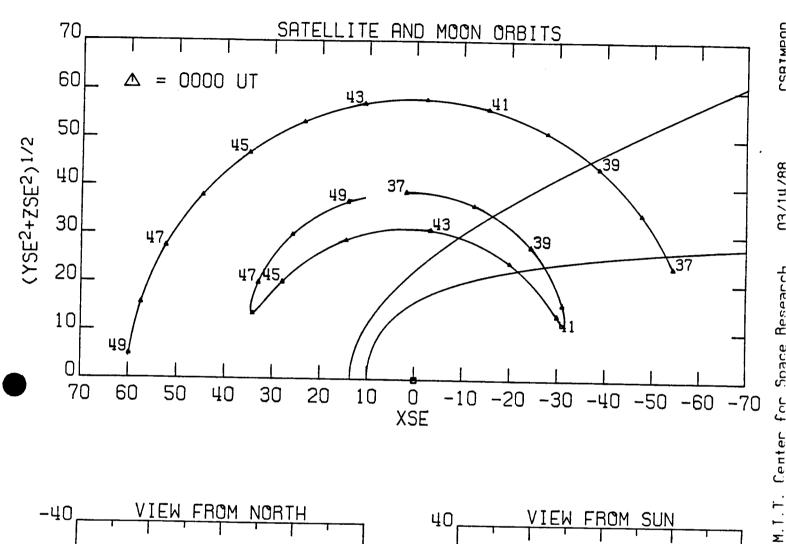
7 TRAJECTORY. ASCENDING NODE 131 FROM JAN 24 TO FEB 5 1977 DAYS 24 THRU 36

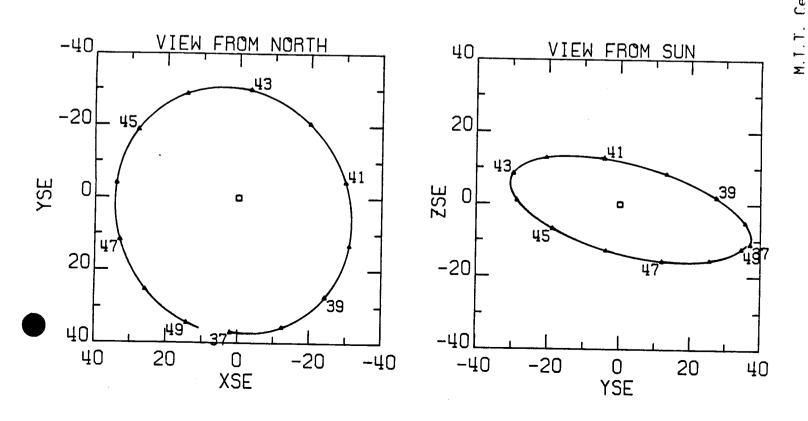


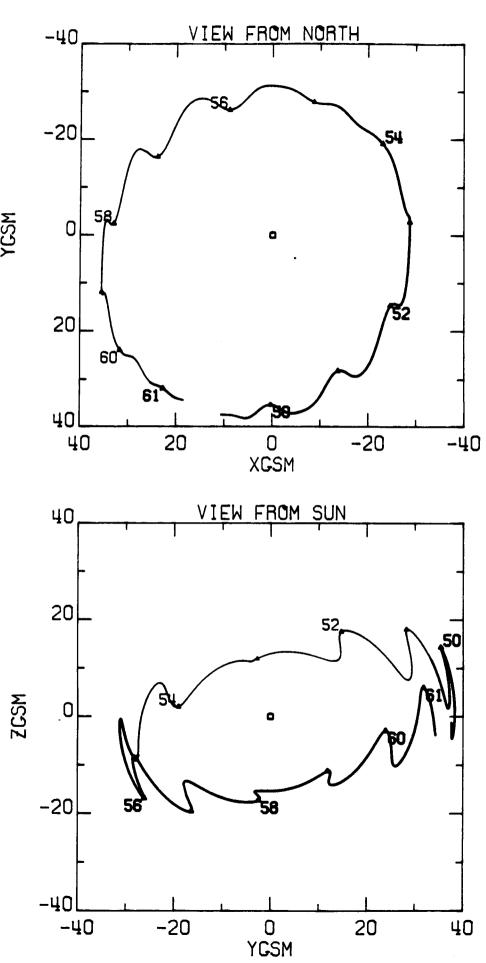




IMP 7 TRAJECTORY. ASCENDING NODE 132
FROM FEB 5 TO FEB 18 1977
DAYS 36 THRU 49



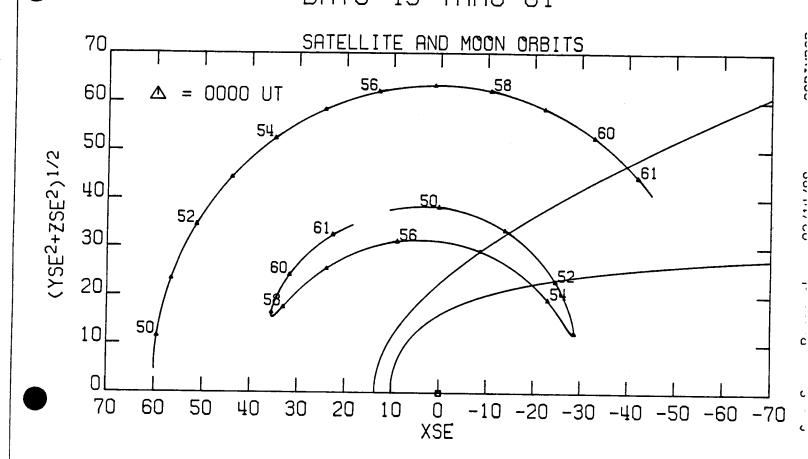


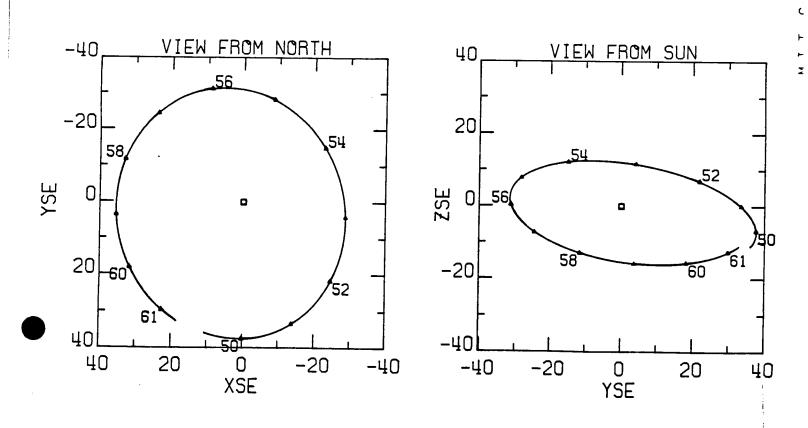


CSR I MPA1

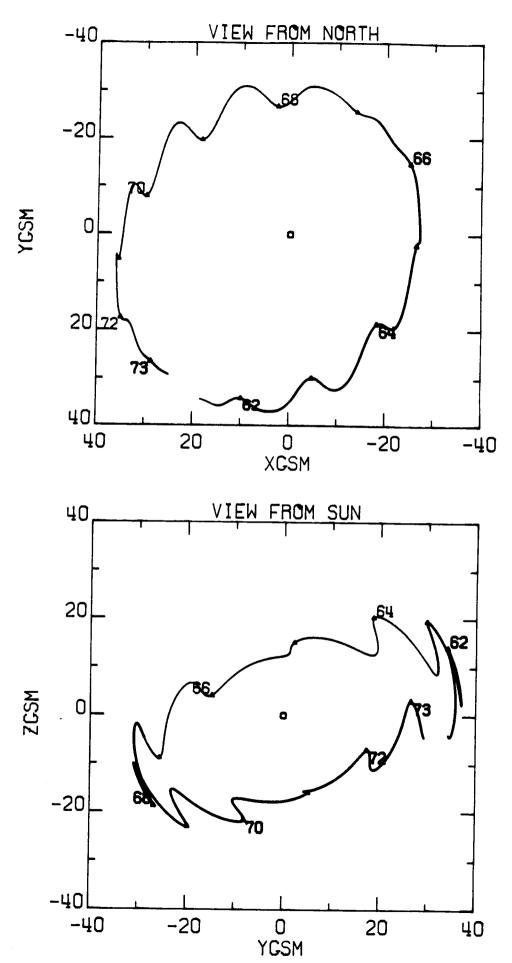
M I T Contor for Joseph Basearch 03/14/88

IMP 7 TRAJECTORY. ASCENDING NODE 133
FROM FEB 18 TO MAR 2 1977
DAYS 49 THRU 61

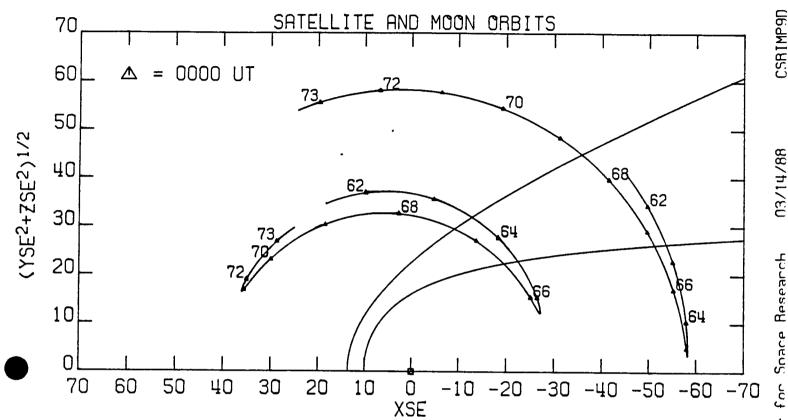


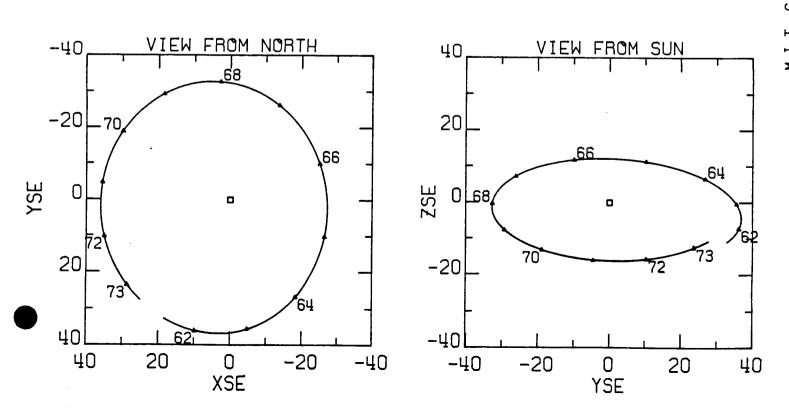


IMP 7 FROM MAR 2 TO MAR 14 1977



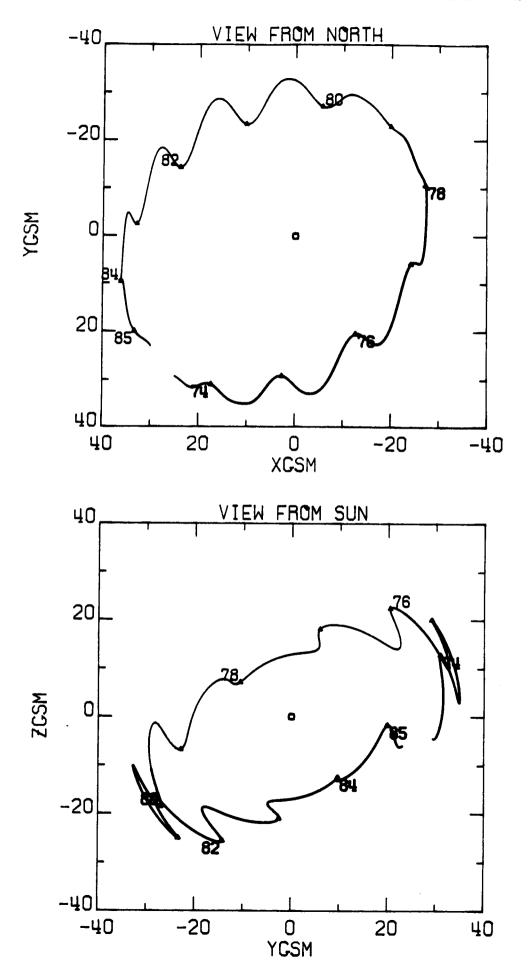
IMP 7 TRAJECTORY. ASCENDING NODE FROM MAR 2 TO MAR 14 1977 61 DAYS THRU



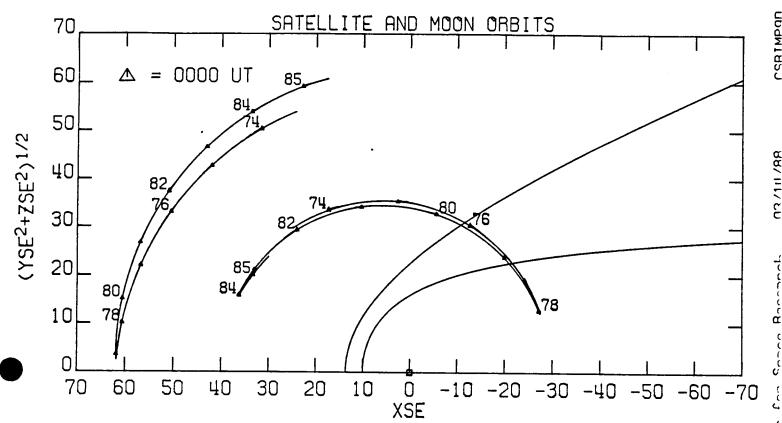


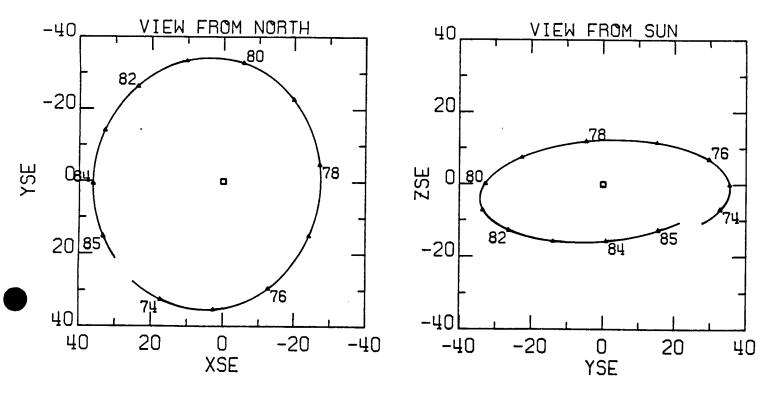
Center for Space Research

IMP 7 FROM MAR 14 TO MAR 26 1977

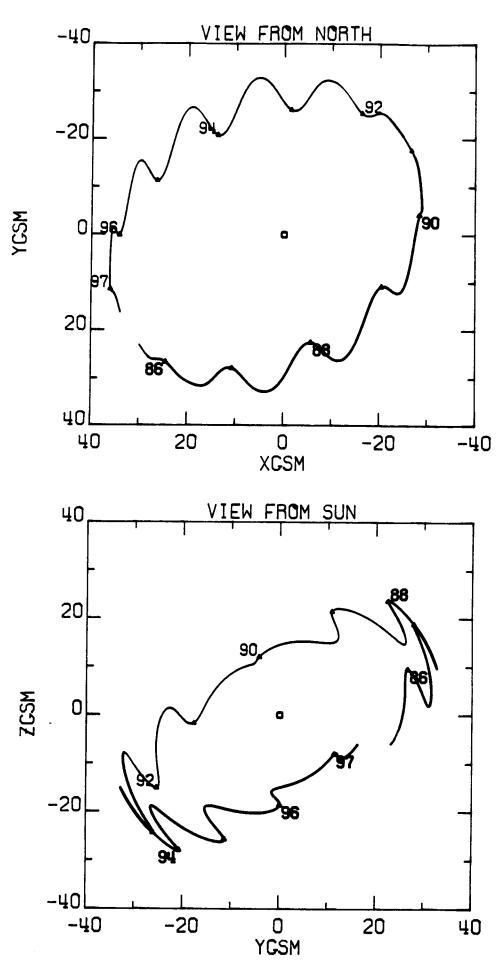


IMP 7 TRAJECTORY. ASCENDING NODE 135
FROM MAR 14 TO MAR 26 1977
DAYS 73 THRU 85

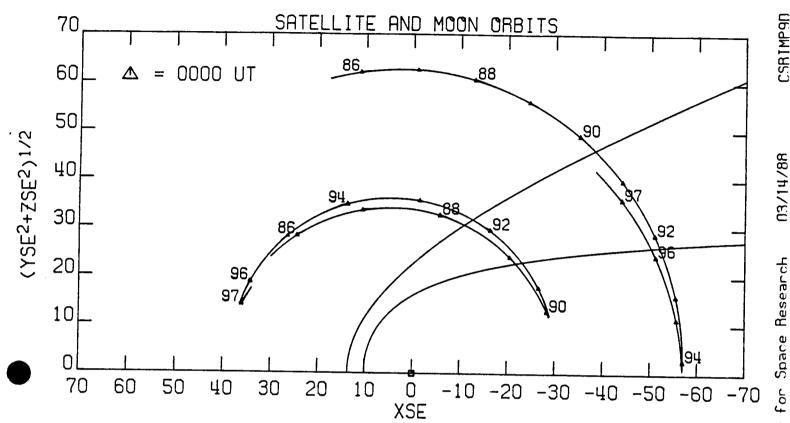


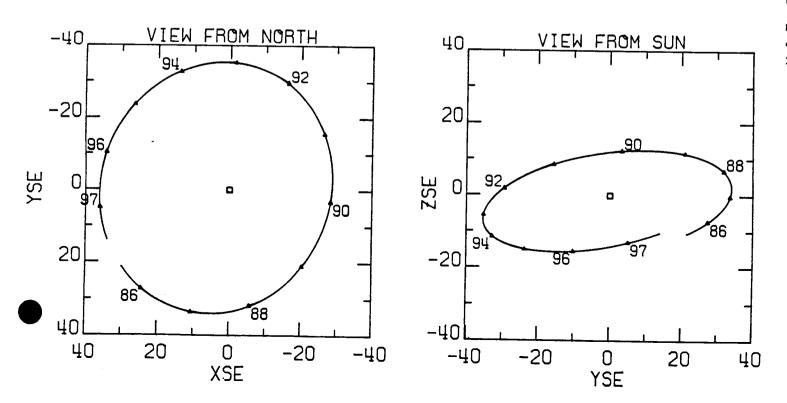


LOTE OF LEW

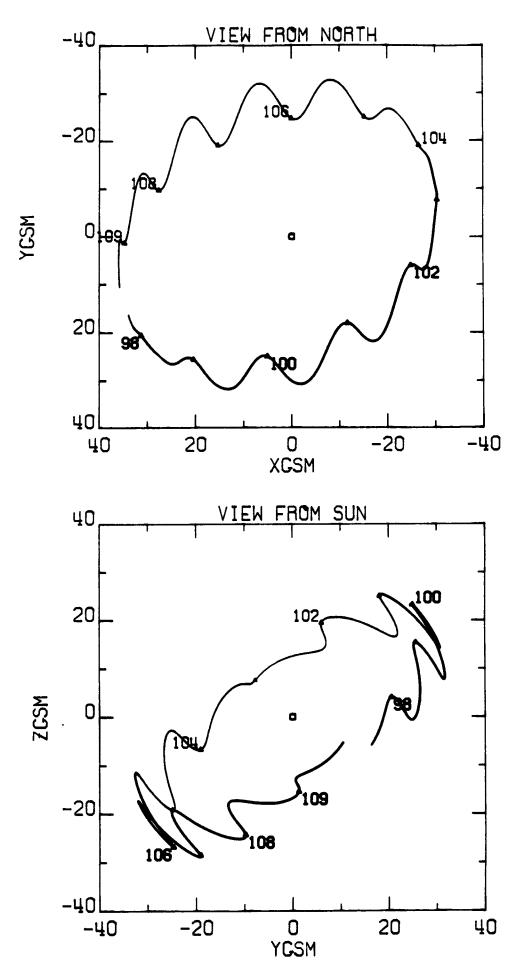


IMP 7 TRAJECTORY. ASCENDING NODE 136 FROM MAR 26 TO APR 7 1977 DAYS 85 THRU

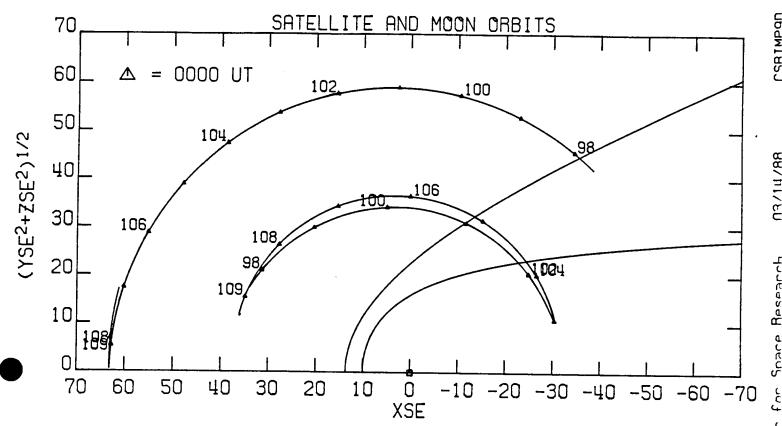


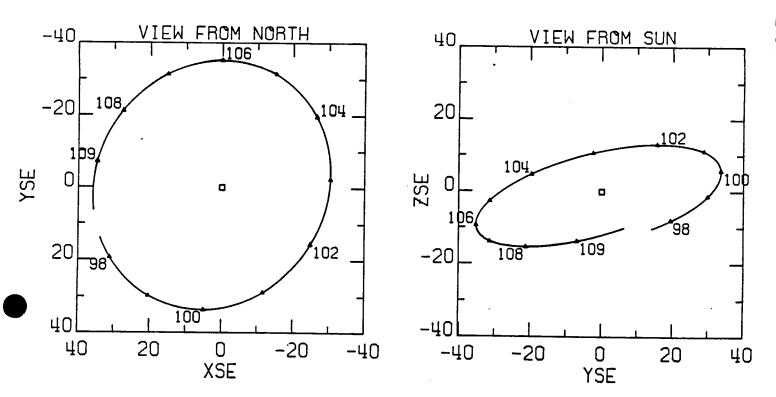


03/14/88 M.I.T. Center for Space Research

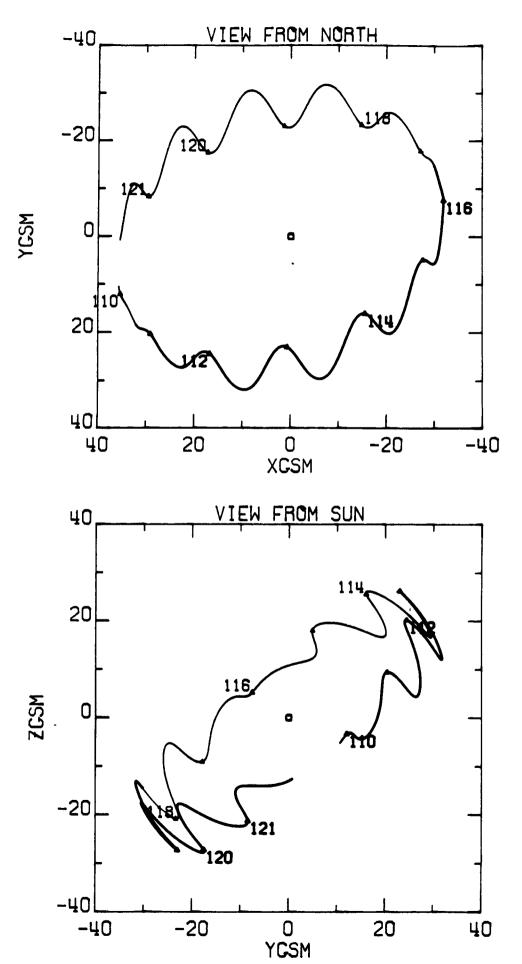


IMP 7 TRAJECTORY. ASCENDING NODE 137 FROM APR TO APR 7 19 1977 DAYS 97 THRU 109



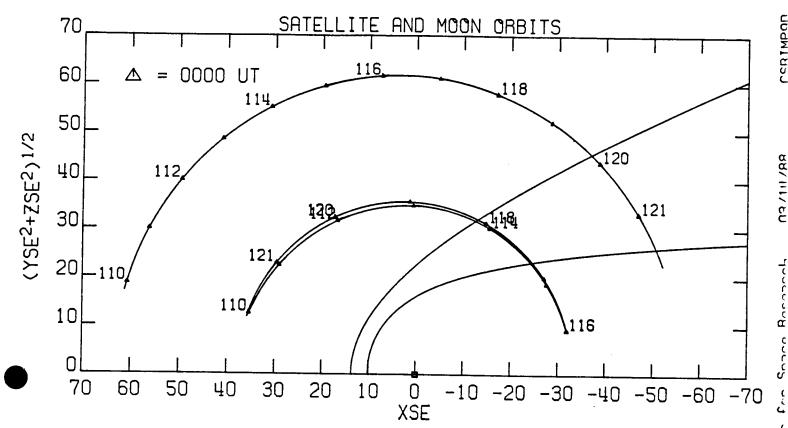


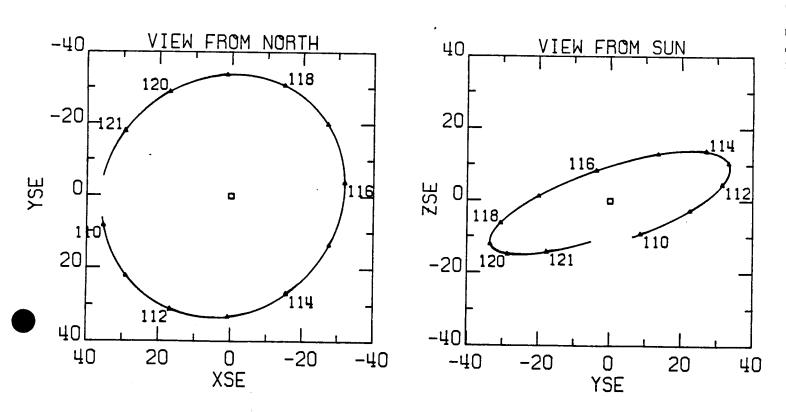
Conter for Space Research



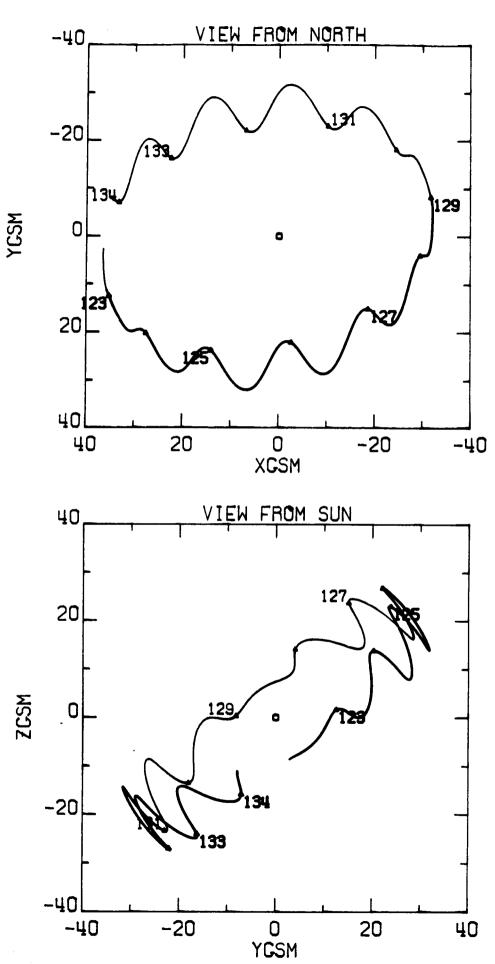
IMP 7 TRAJECTORY. ASCENDING NODE 138

FROM APR 19 TO MAY 2 1977 DAYS 109 THRU 121





T Tonton for Sound



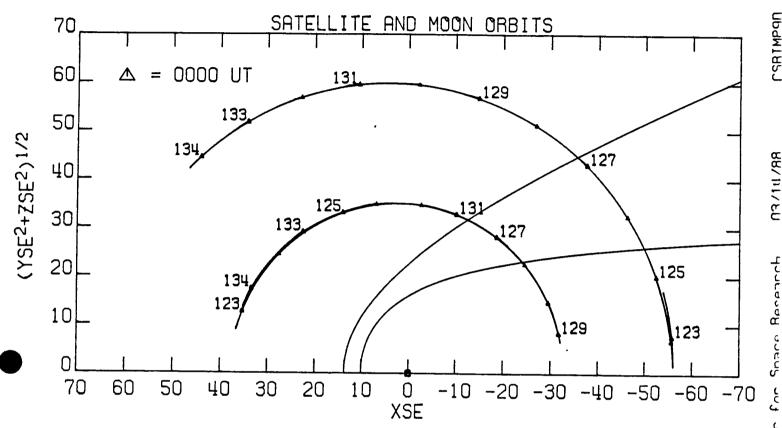
CCDIMODI

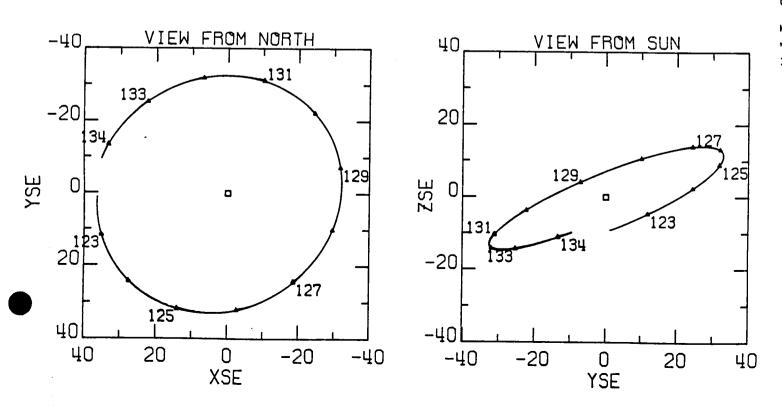
A8/111/80

Bossale a

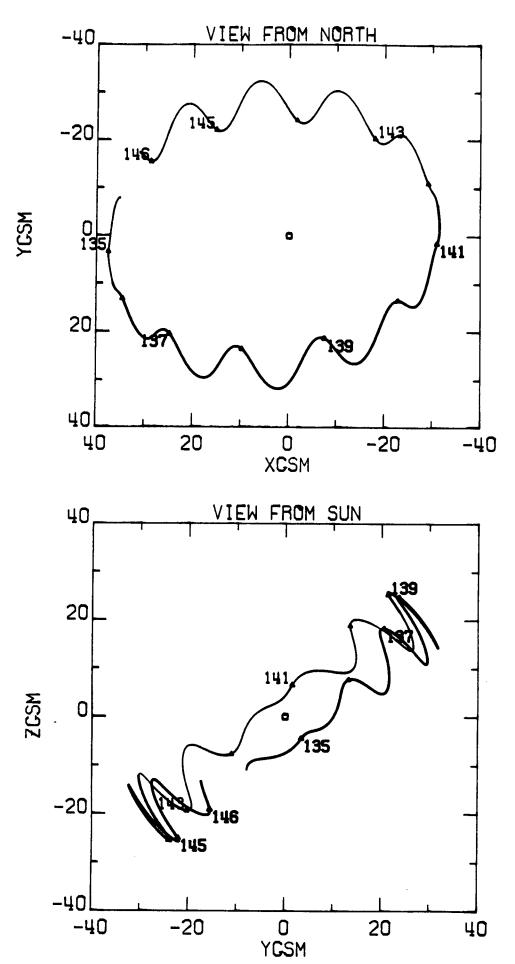
J votao

IMP 7 TRAJECTORY. ASCENDING NODE 139 FROM MAY 2 TO MAY 14 1977 DAYS 122 THRU 134

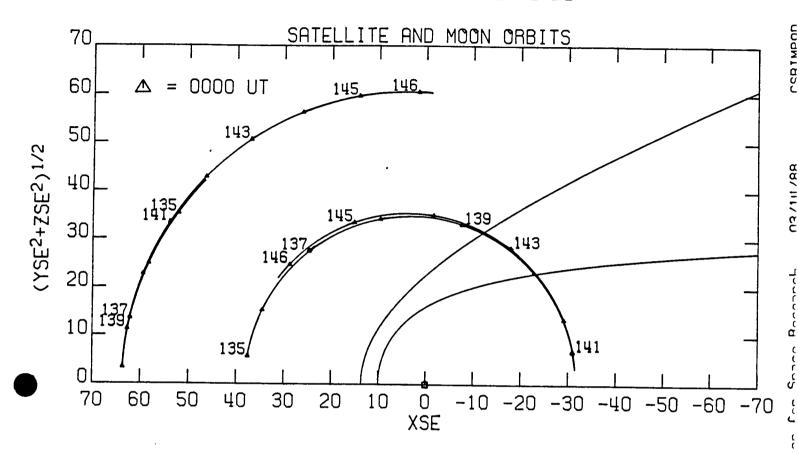


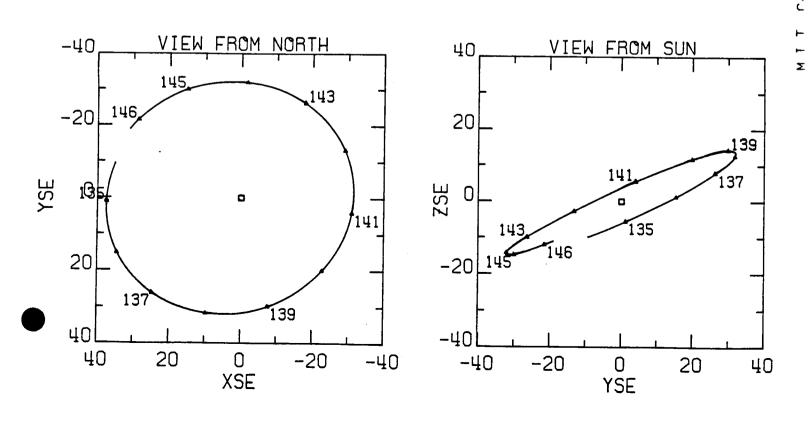


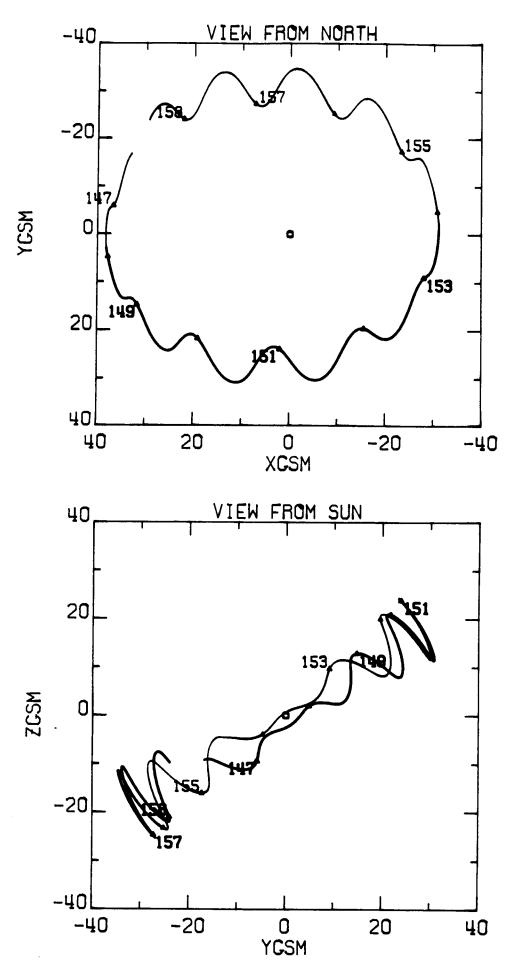
Fouter for Snace Receased



IMP 7 TRAJECTORY. ASCENDING NODE 140
FROM MAY 14 TO MAY 26 1977
DAYS 134 THRU 146

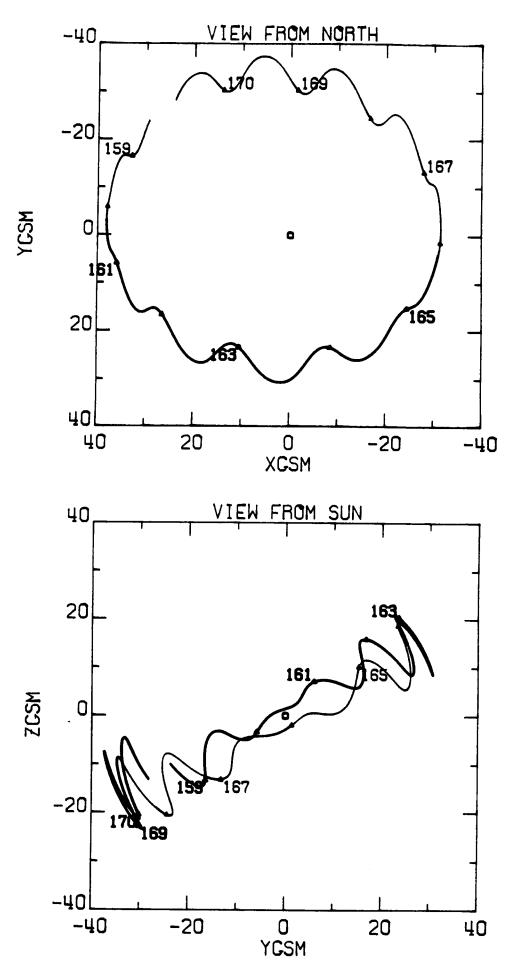






IMP 7 TRAJECTORY. ASCENDING NODE 141 FROM MAY 26 TO JUN DAYS THRU CSRIMPON SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>) 1/2 151 Ō XSE -20 -30 -40 -50 -10 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 YSE ZSE 158,155 20 149 -20 -40 XSE -20 -40 -40 -20 YSE 

IMP 7 FROM JUN 7 TO JUN 19 1977

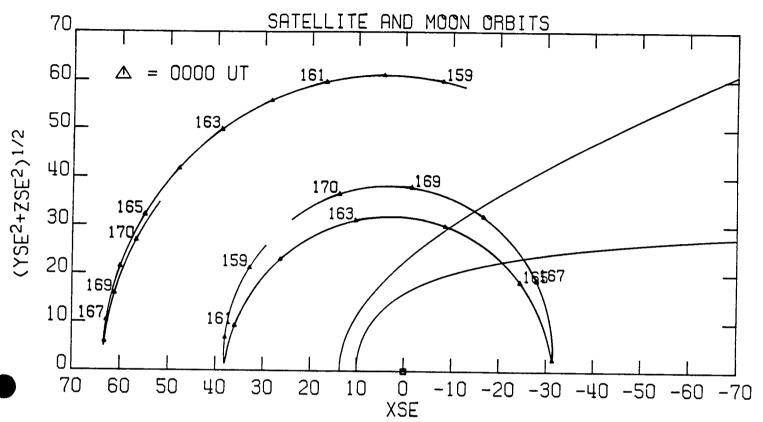


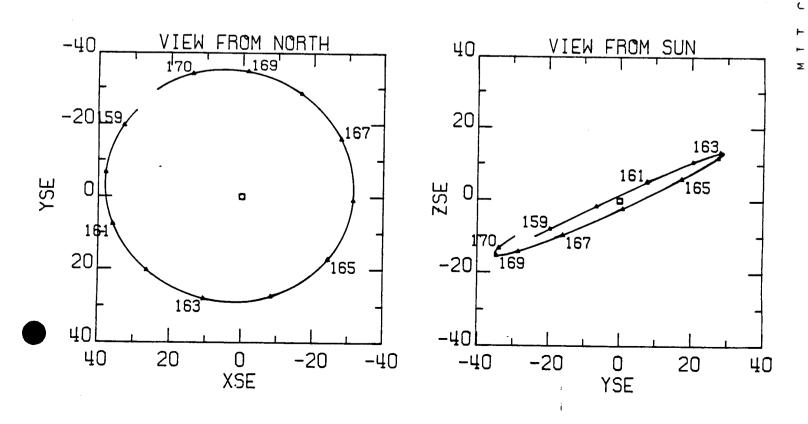
IMP 7 TRAJECTORY. ASCENDING NODE 142

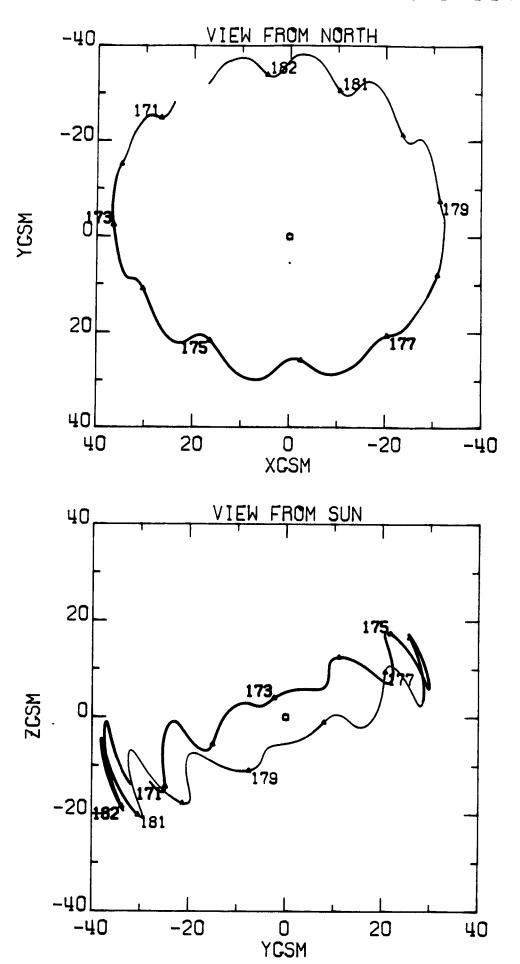
FROM JUN 7 TO JUN 19 1977

DAYS 158 THRU 170

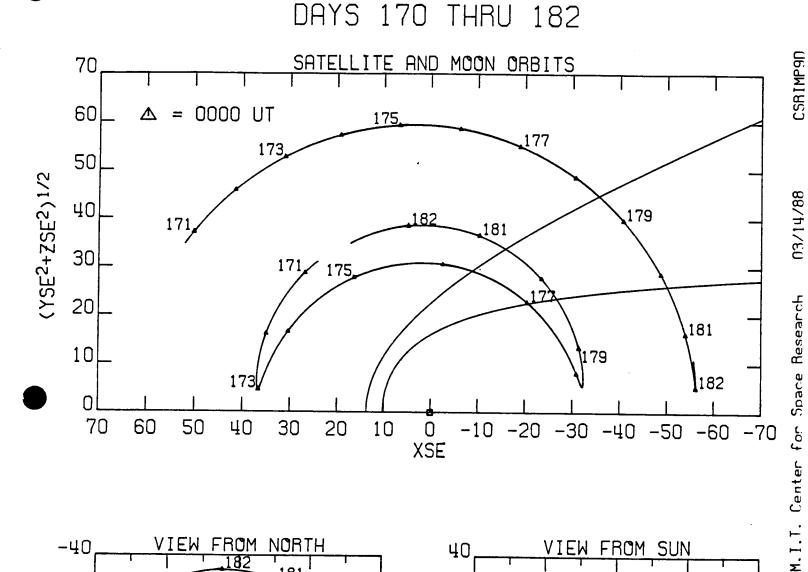
SATELLITE AND MOON ORBITS

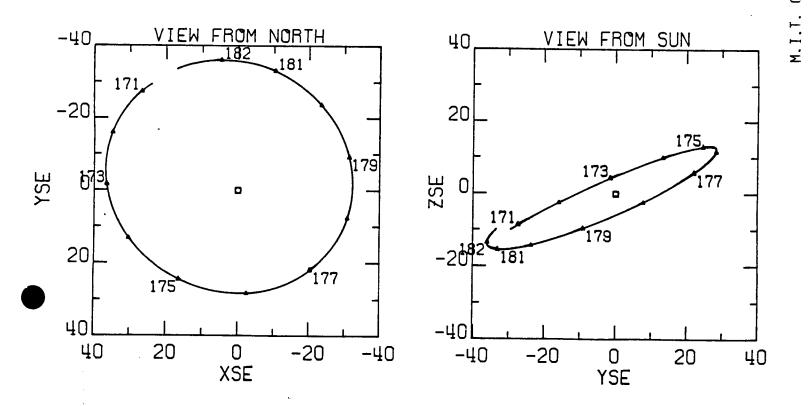


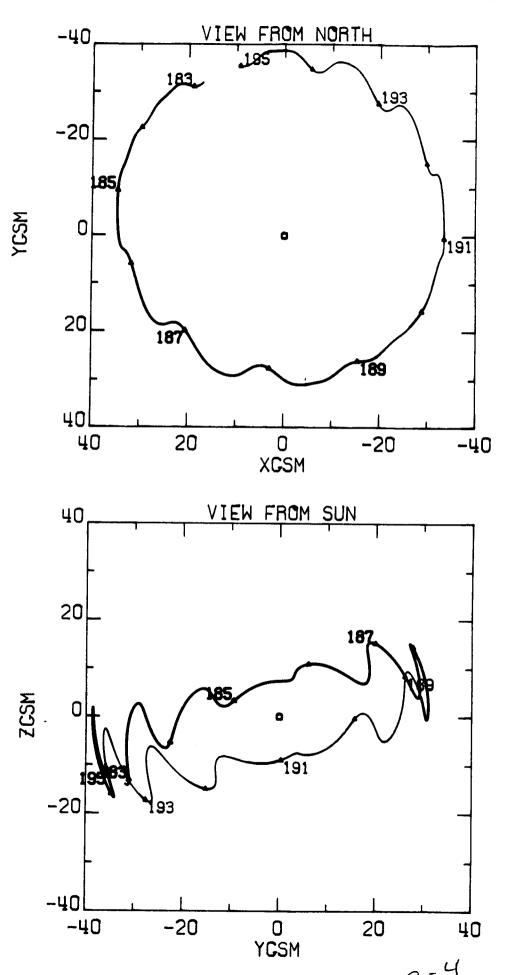




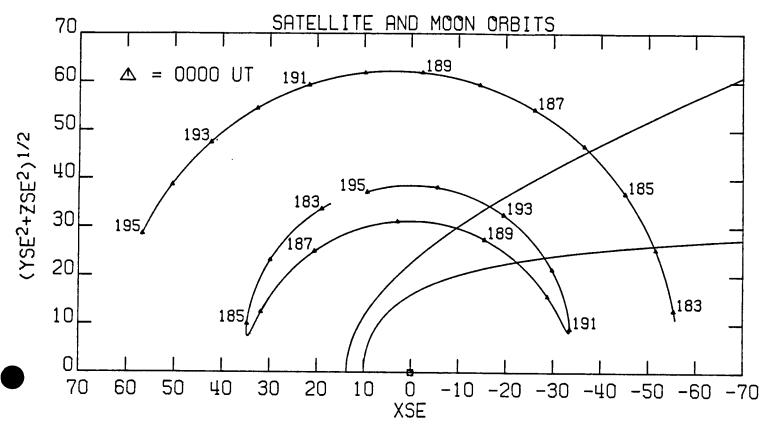
IMP 7 TRAJECTORY. ASCENDING NODE 143
FROM JUN 19 TO JUL 1 1977





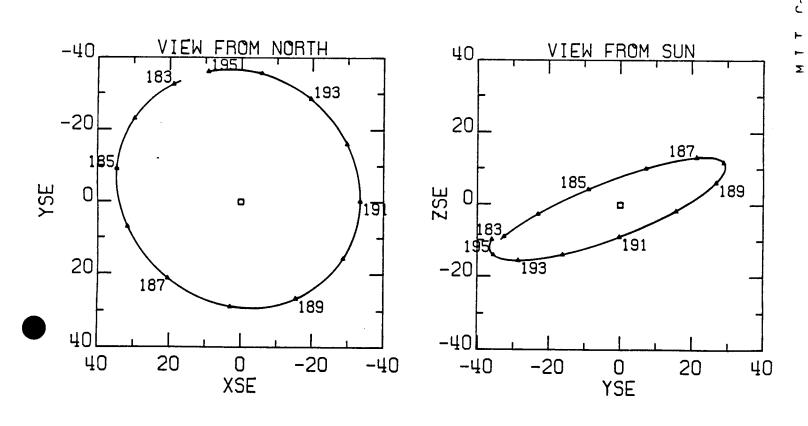


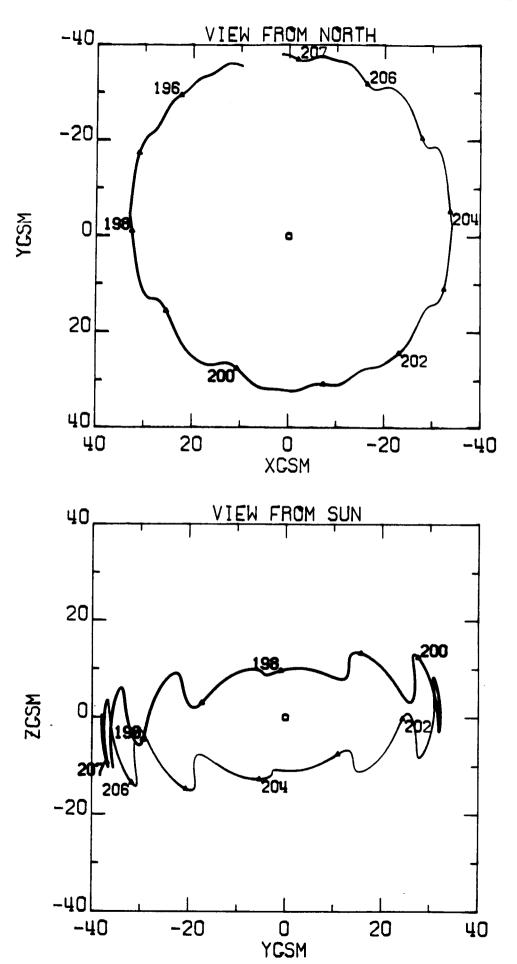
IMP 7 TRAJECTORY. ASCENDING NODE 144
FROM JUL 1 TO JUL 14 1977
DAYS 182 THRU 195



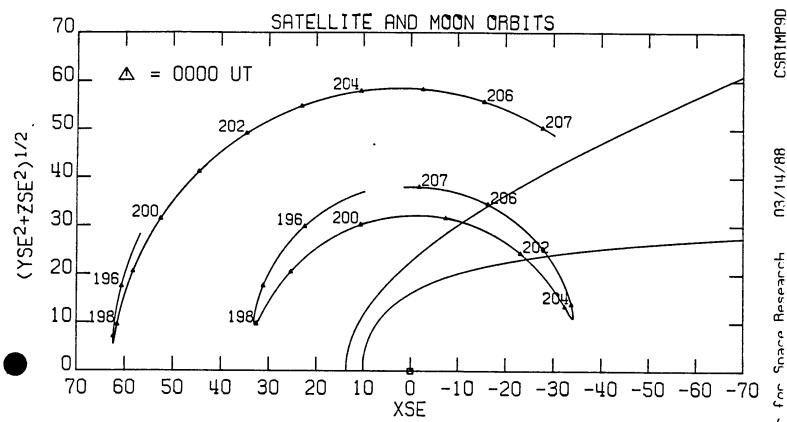
**CSRIMPGN** 

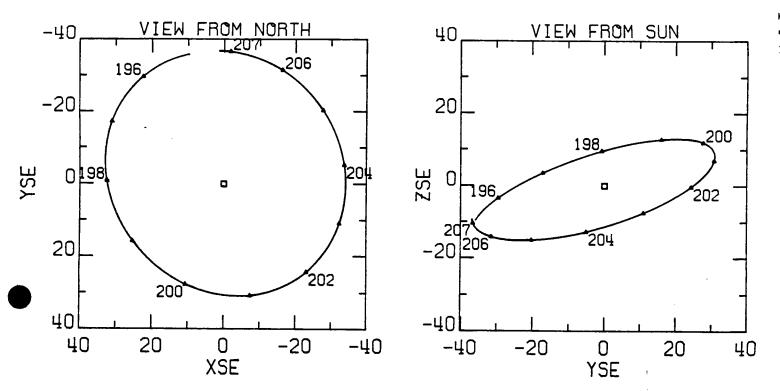
**N3/111/88** 



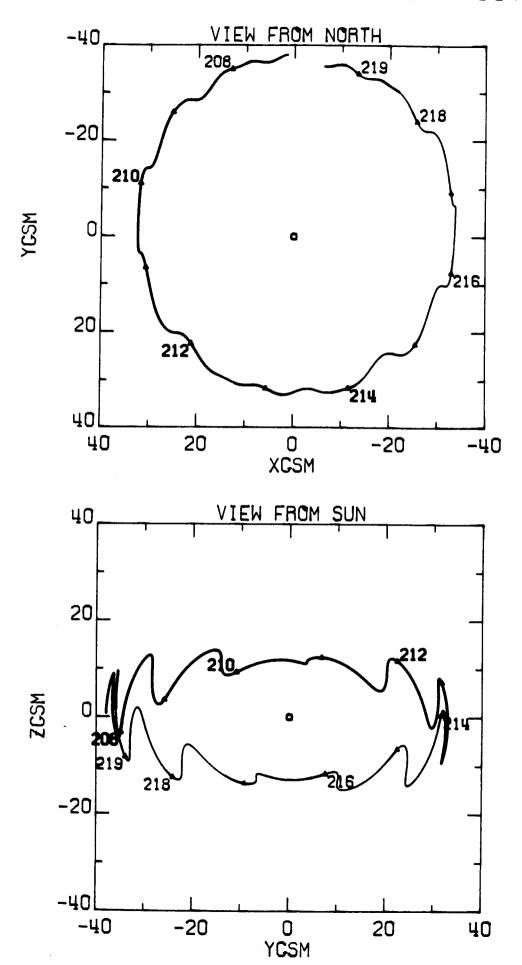


IMP 7 TRAJECTORY. ASCENDING NODE 145 FROM JUL 14 TO JUL 26 1977 195 **THRU 207** DAYS



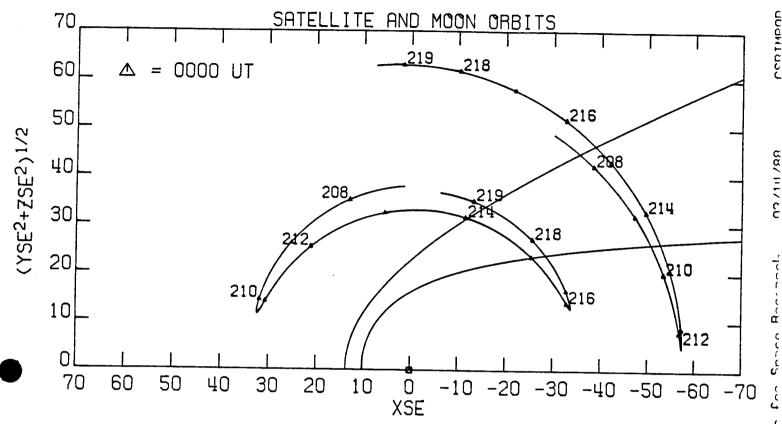


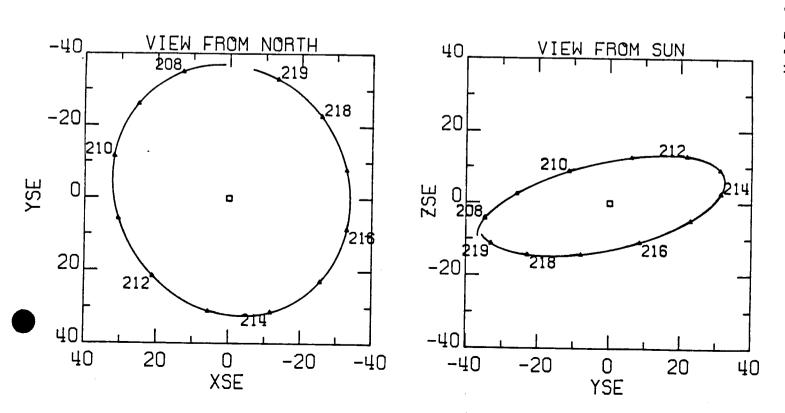
M. I. T. Center for Space Research



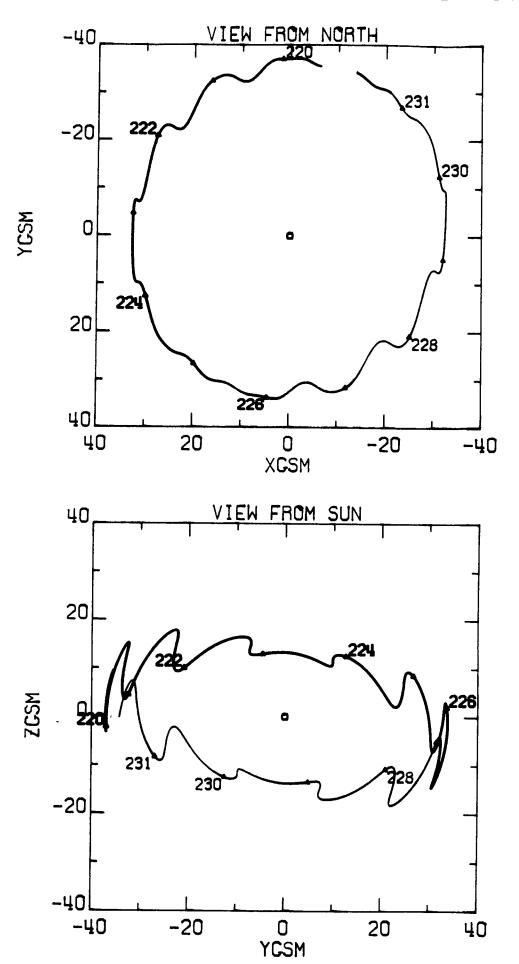
IMP 7 TRAJECTORY. ASCENDING NODE 146

FROM JUL 26 TO AUG 7 1977 DAYS 207 THRU 219





IMP 7 FROM AUG 7 TO AUG 19 1977



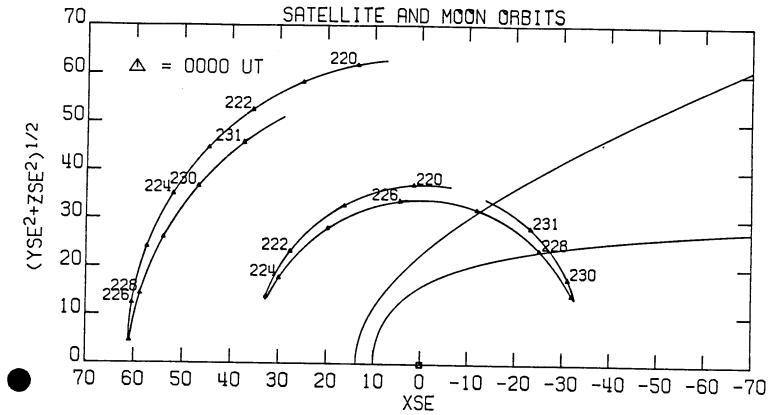
IMP 7 TRAJECTORY. ASCENDING NODE 147

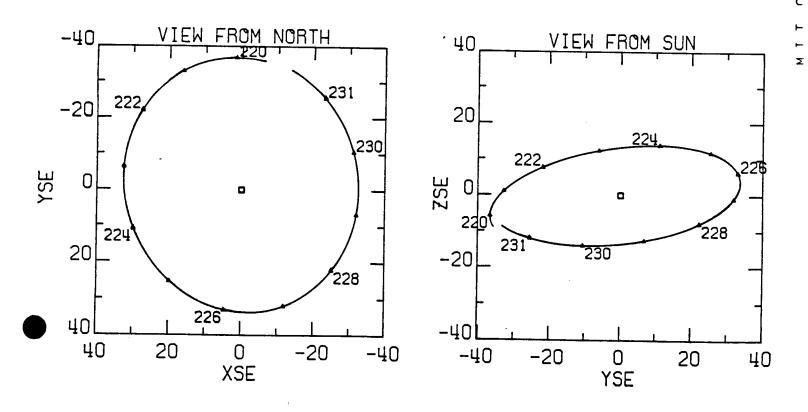
FROM AUG 7 TO AUG 19 1977

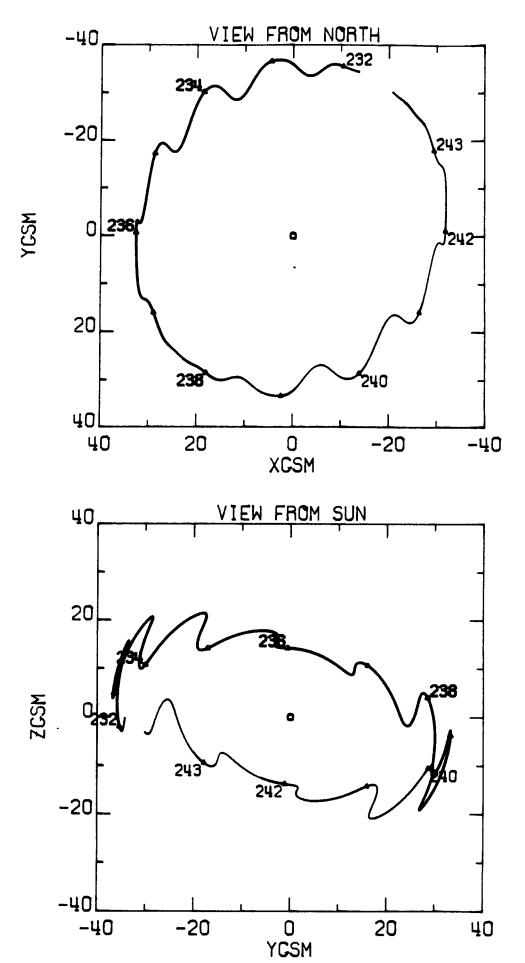
DAYS 219 THRU 231

SATELLITE AND MOON ORBITS

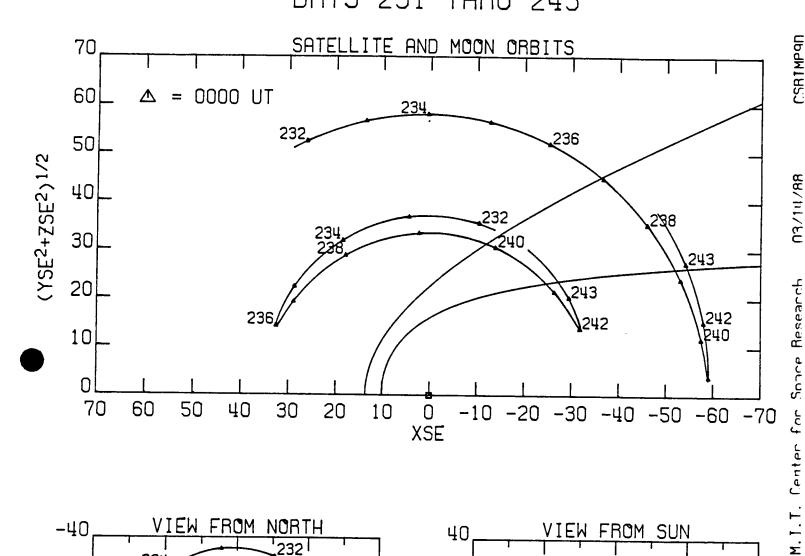
A = 0000 UT 220

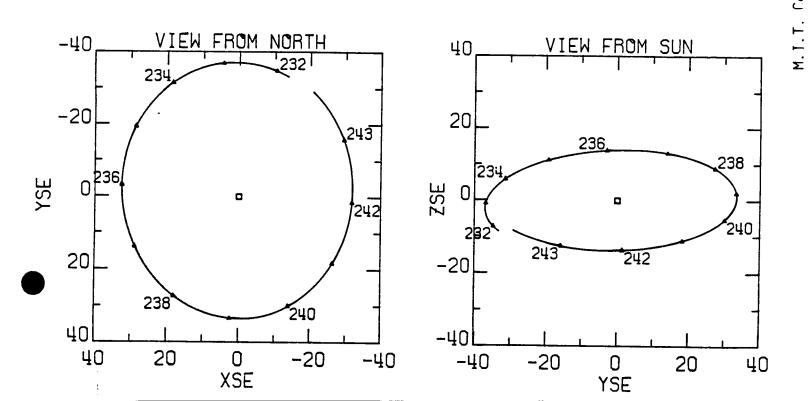


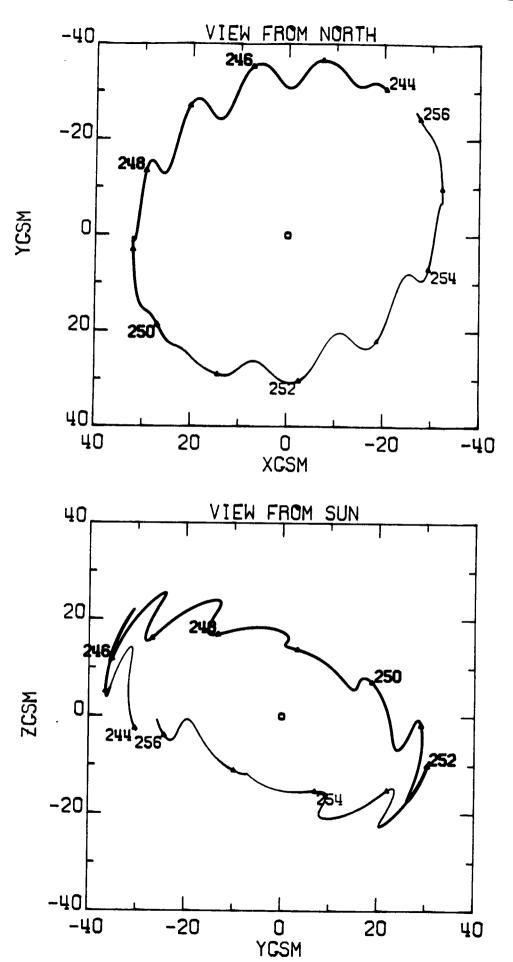




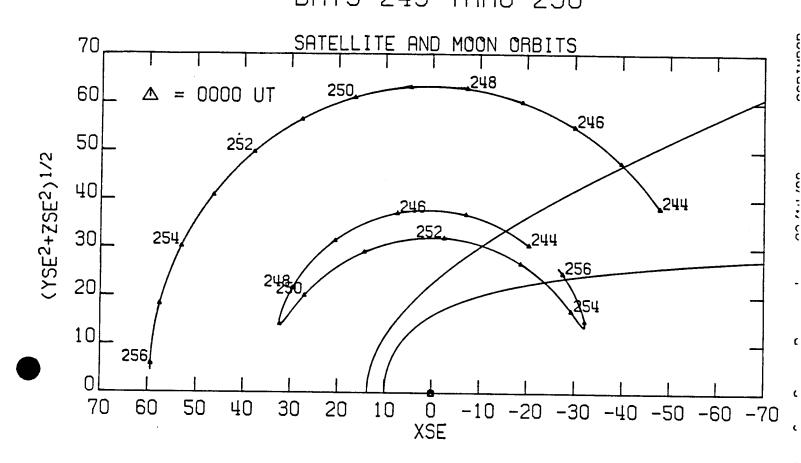
IMP 7 TRAJECTORY. ASCENDING NODE 148
FROM AUG 19 TO AUG 31 1977
DAYS 231 THRU 243

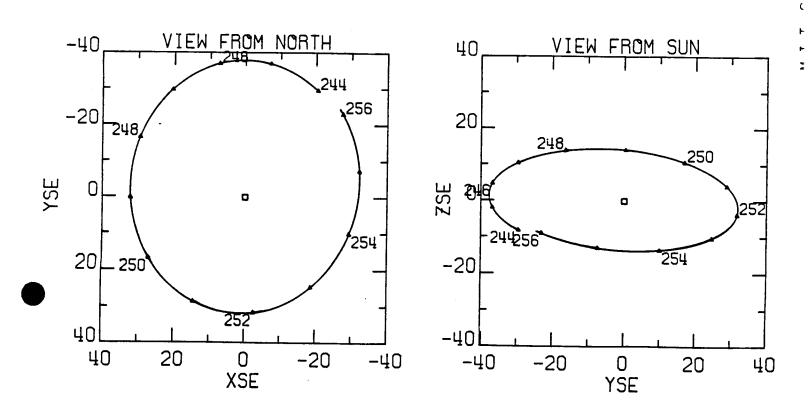


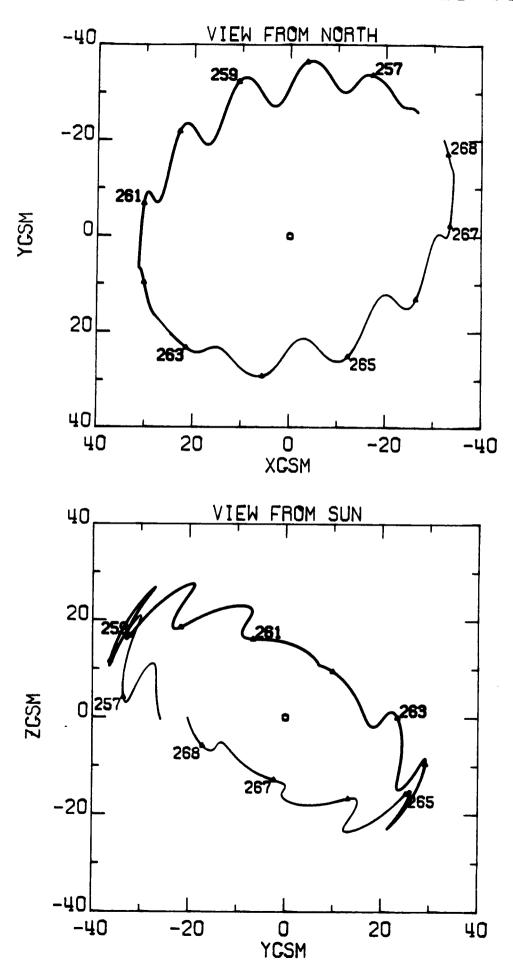




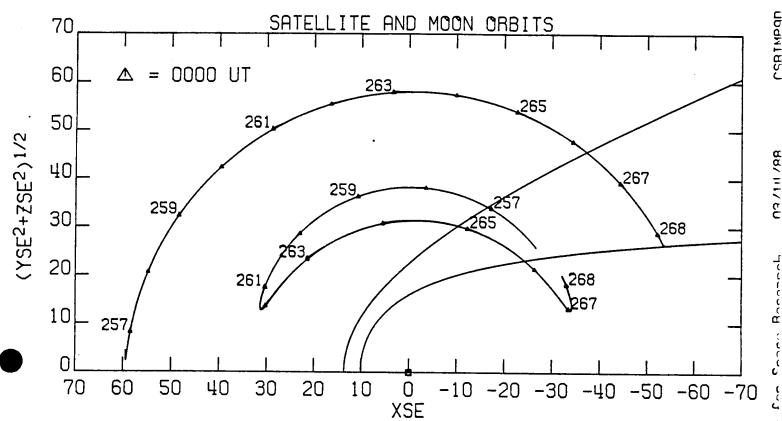
IMP 7 TRAJECTORY. ASCENDING NODE 149
FROM AUG 31 TO SEP 13 1977
DAYS 243 THRU 256

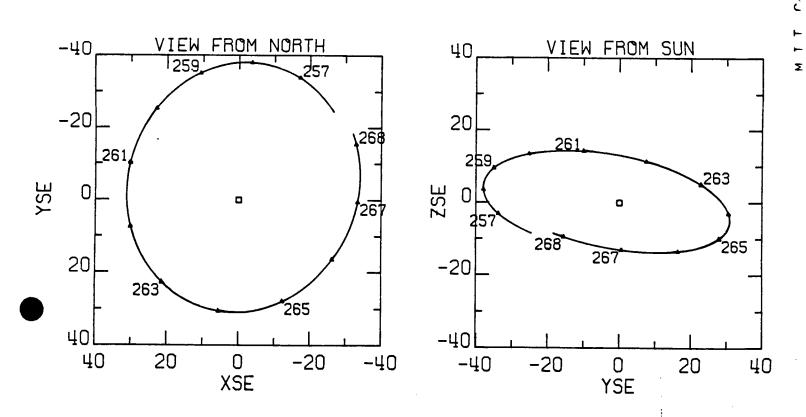


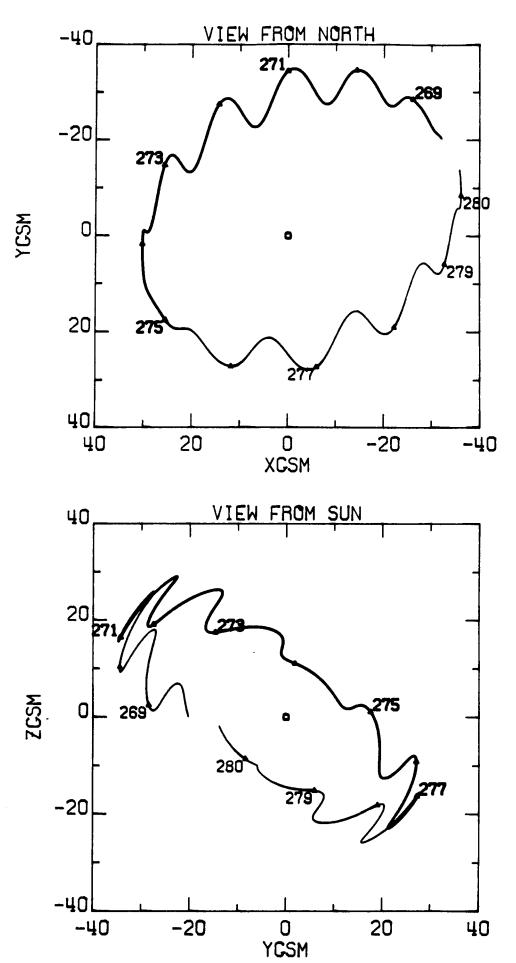




IMP 7 TRAJECTORY. ASCENDING NODE 150 FROM SEP 13 TO SEP 25 1977 DAYS 256 THRU 268

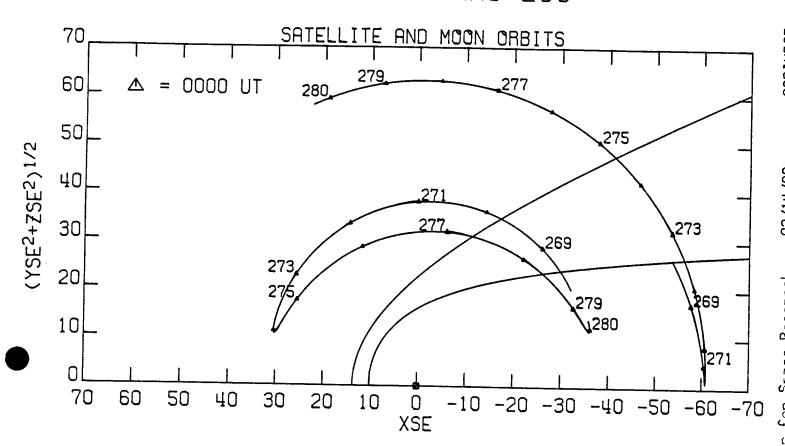


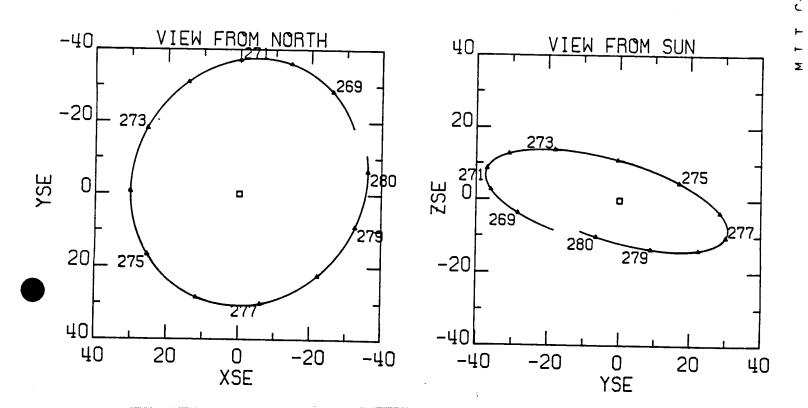


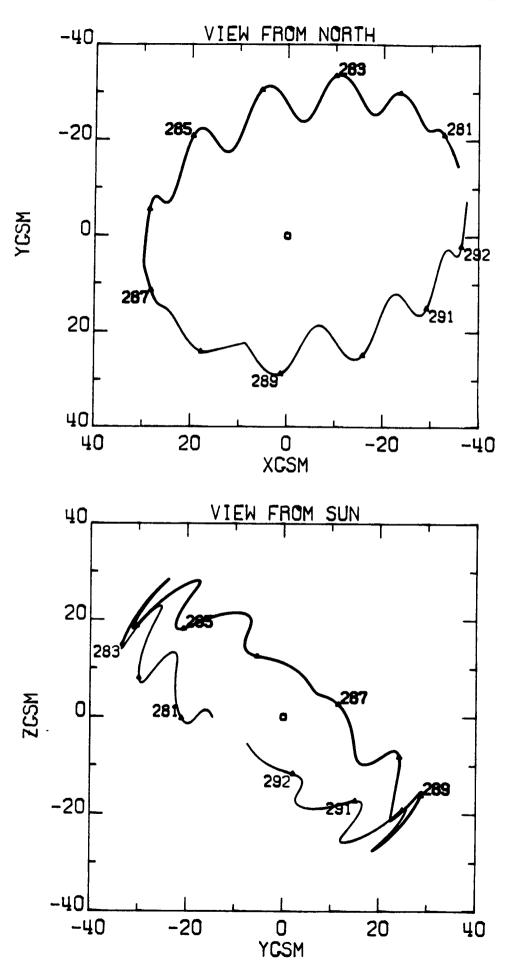


IMP 7 TRAJECTORY. ASCENDING NODE 151

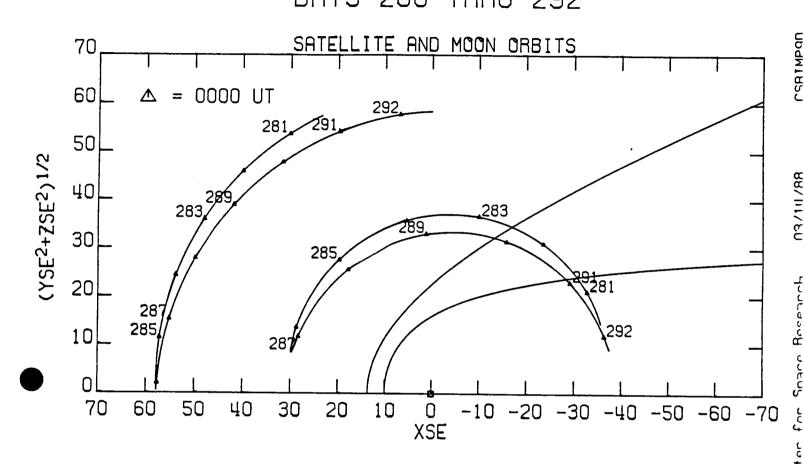
FROM SEP 25 TO OCT 7 1977
DAYS 268 THRU 280

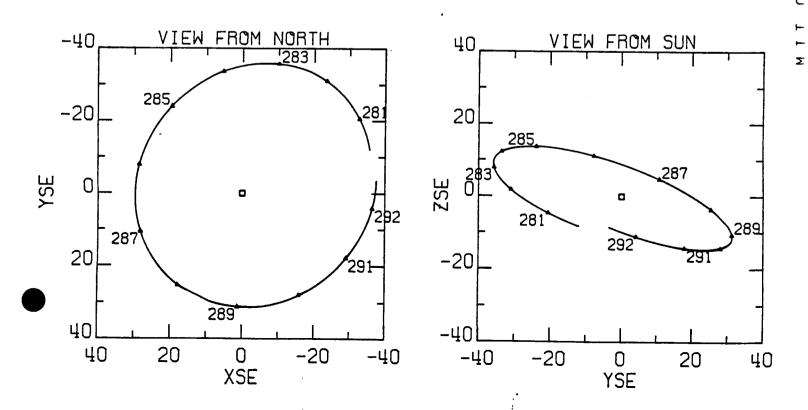


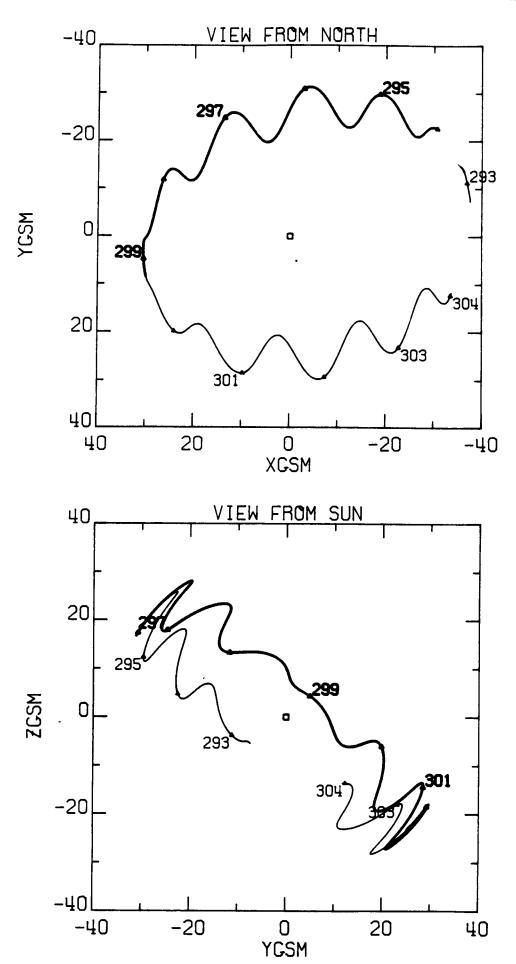




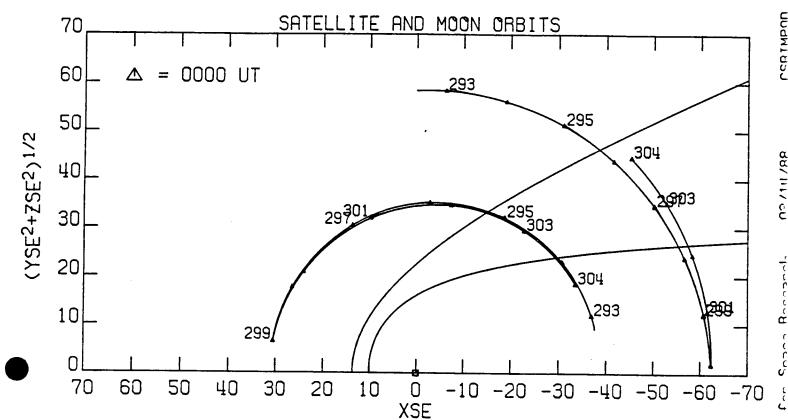
IMP 7 TRAJECTORY. ASCENDING NODE 152
FROM OCT 7 TO OCT 19 1977
DAYS 280 THRU 292

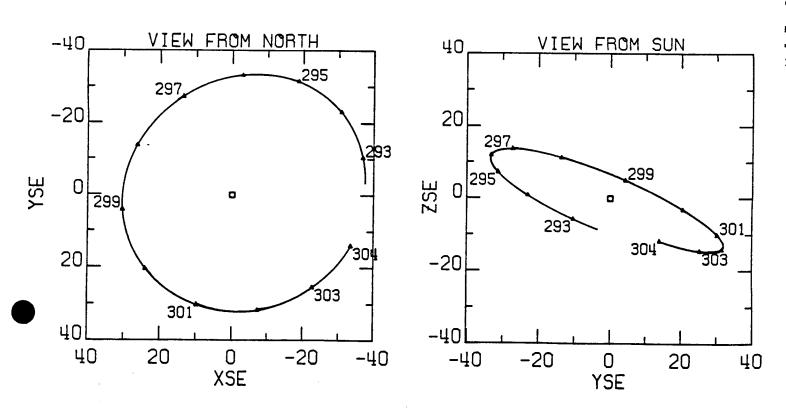


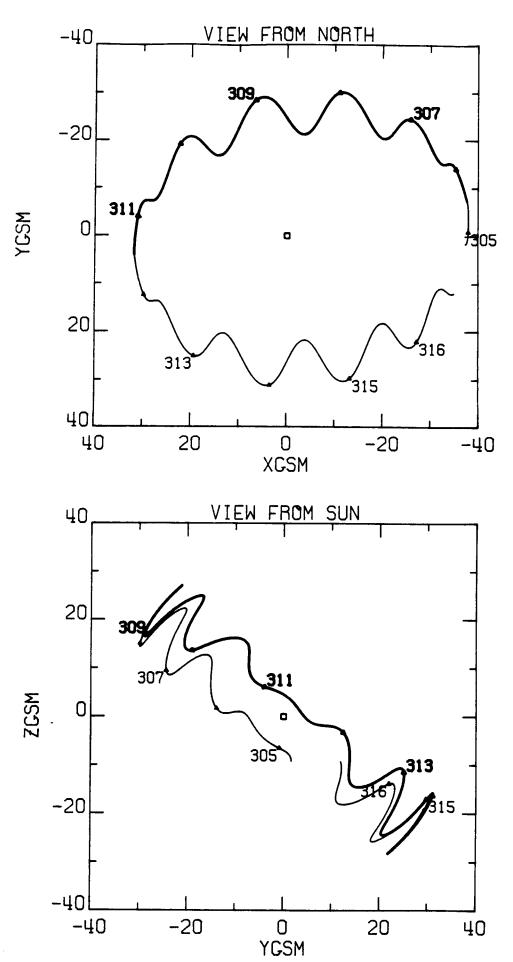




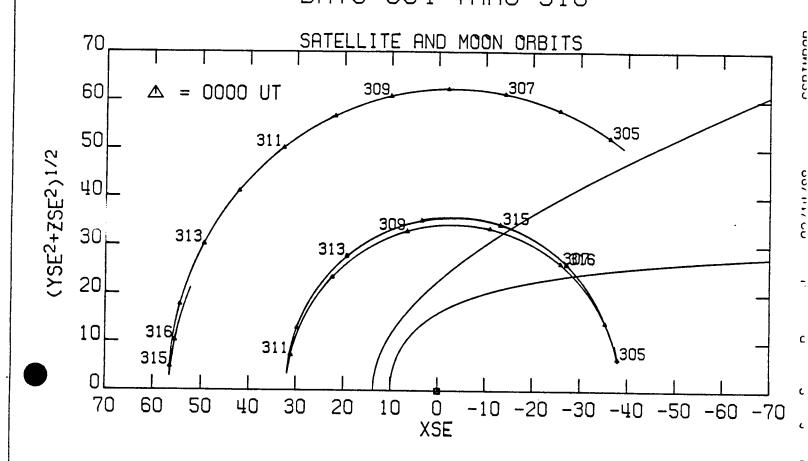
IMP 7 TRAJECTORY. ASCENDING NODE 153 FROM OCT 19 TO OCT 31 1977 DAYS 292 THRU 304

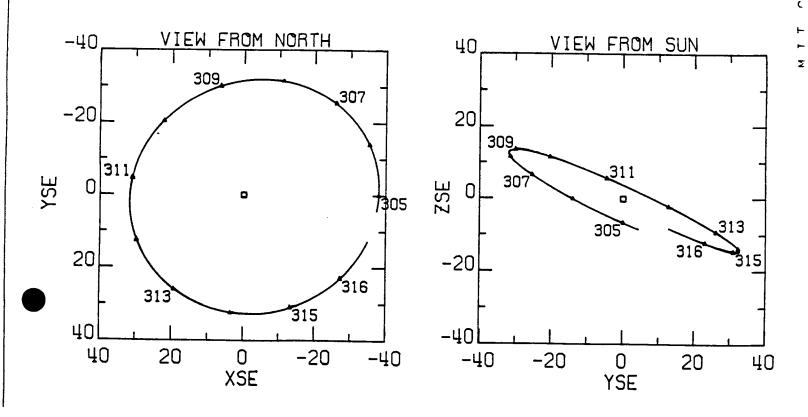


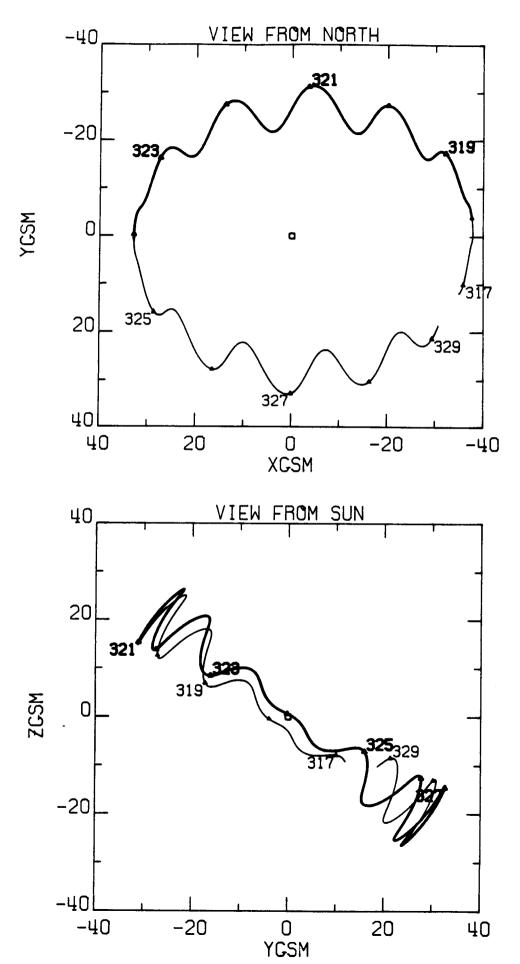




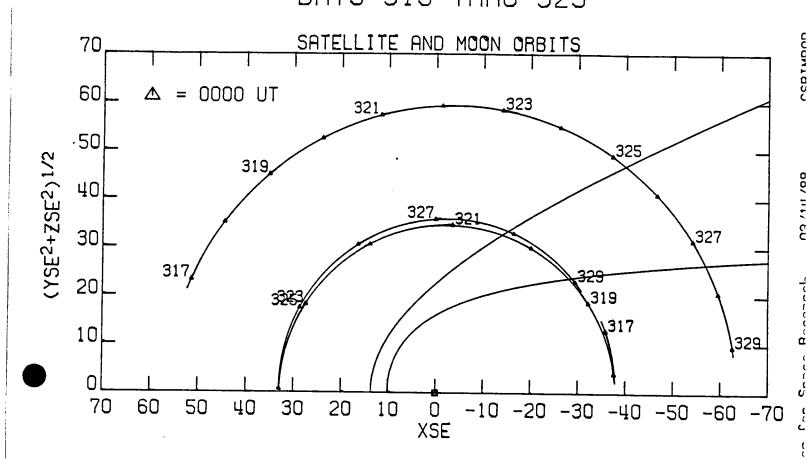
IMP 7 TRAJECTORY. ASCENDING NODE 154
FROM OCT 31 TO NOV 12 1977
DAYS 304 THRU 316

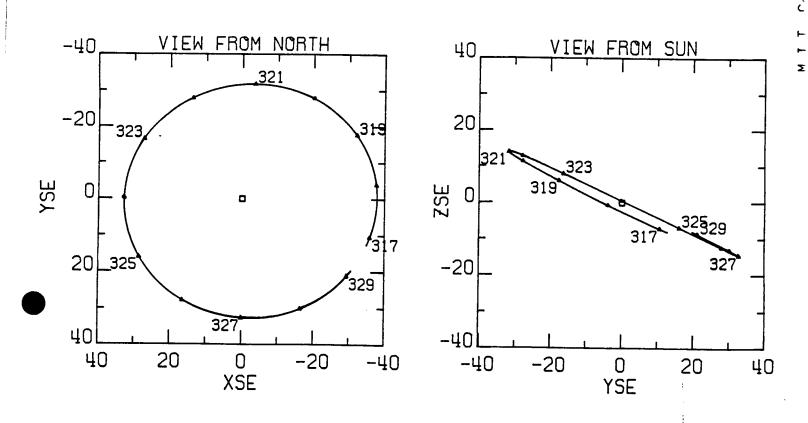


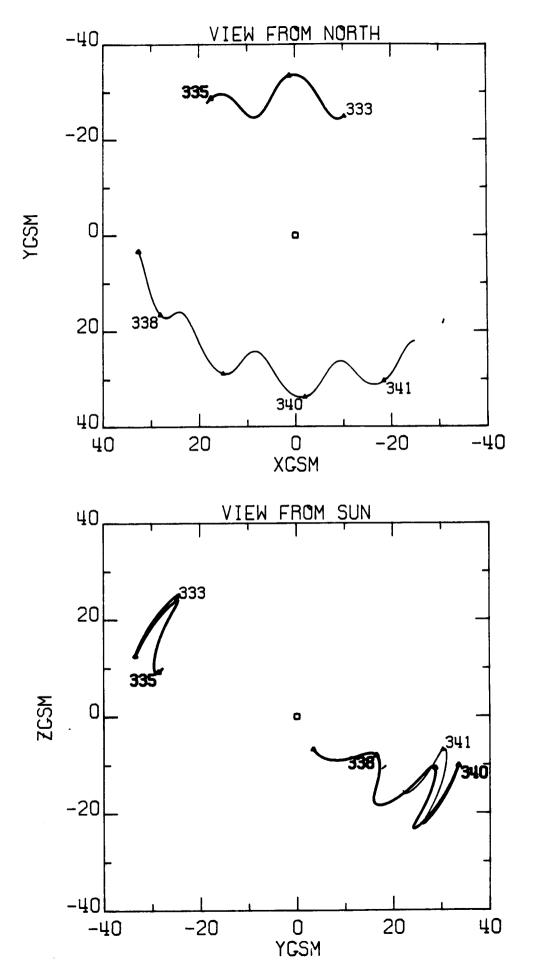




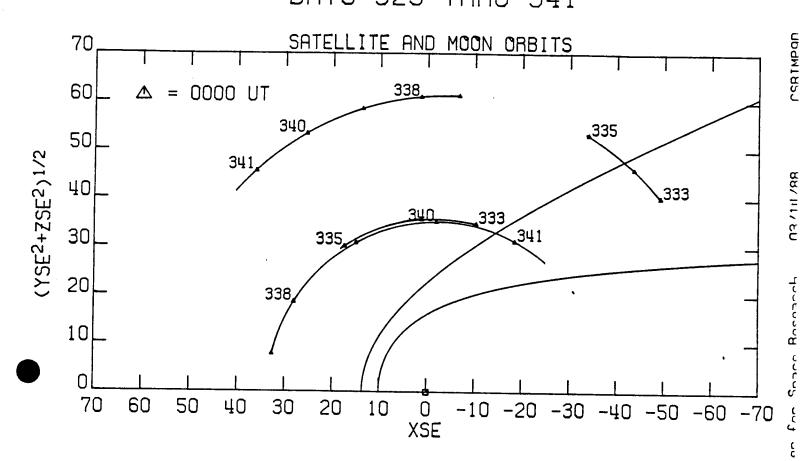
IMP 7 TRAJECTORY. ASCENDING NODE 155
FROM NOV 12 TO NOV 25 1977
DAYS 316 THRU 329

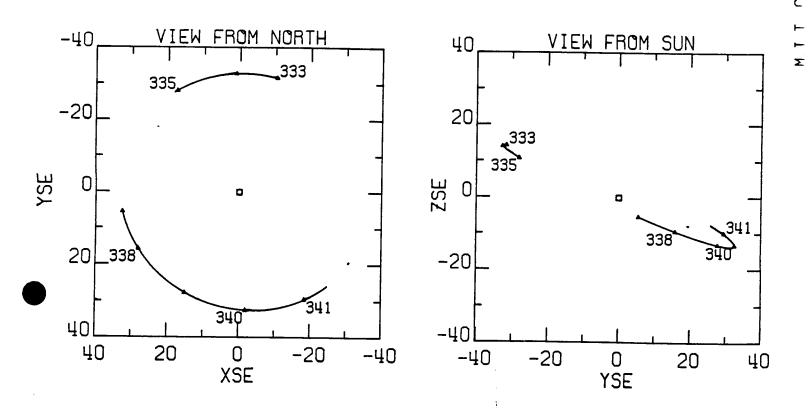


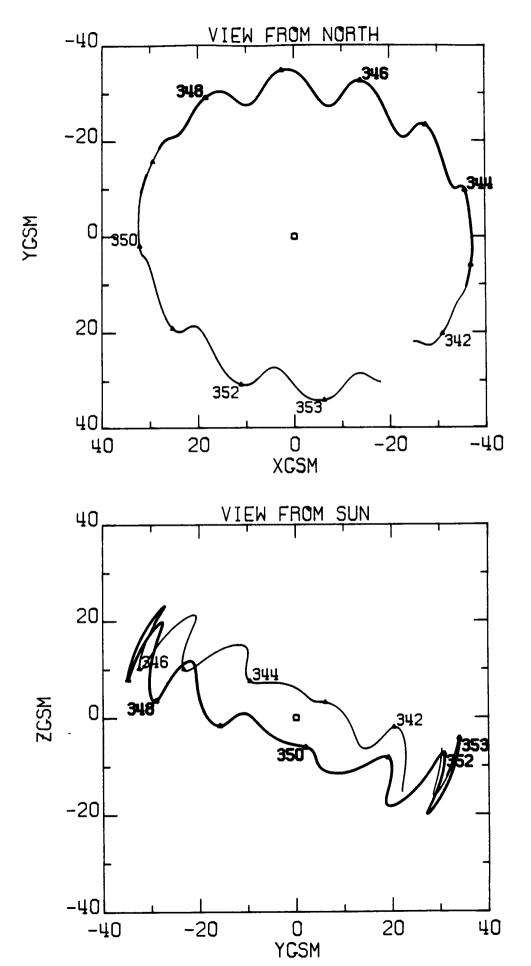




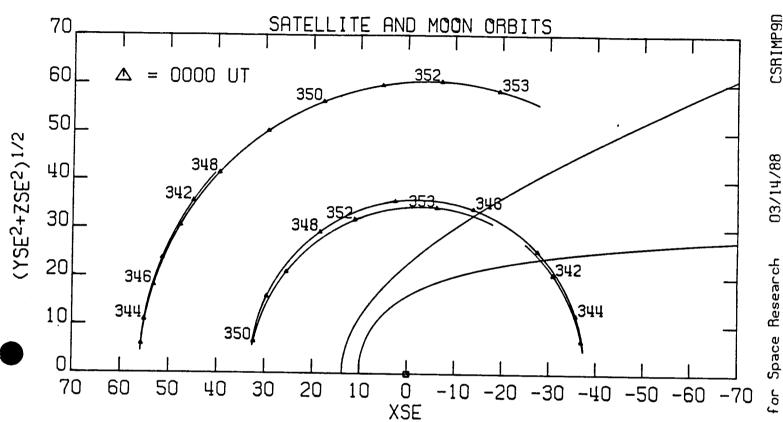
IMP 7 TRAJECTORY. ASCENDING NODE 156
FROM NOV 25 TO DEC 7 1977
DAYS 329 THRU 341

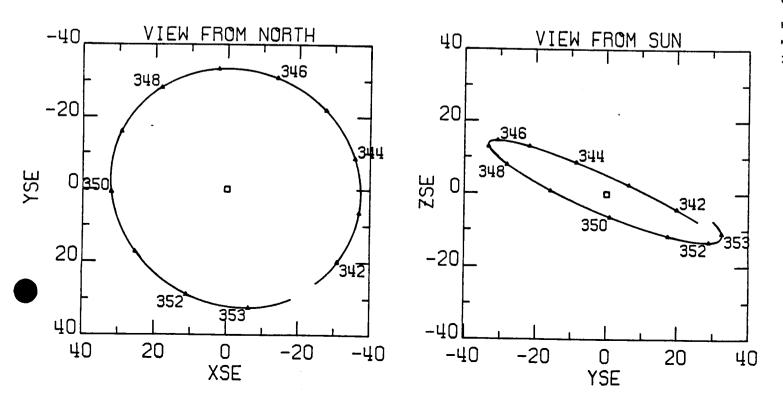




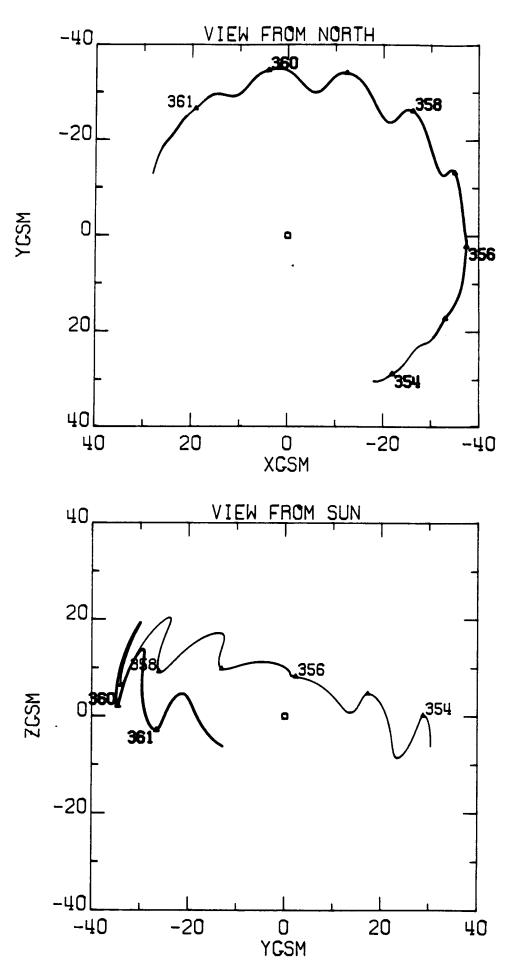


IMP 7 TRAJECTORY. ASCENDING NODE 157 FROM DEC TO DEC 7 19 1977 DAYS 341 THRU 353

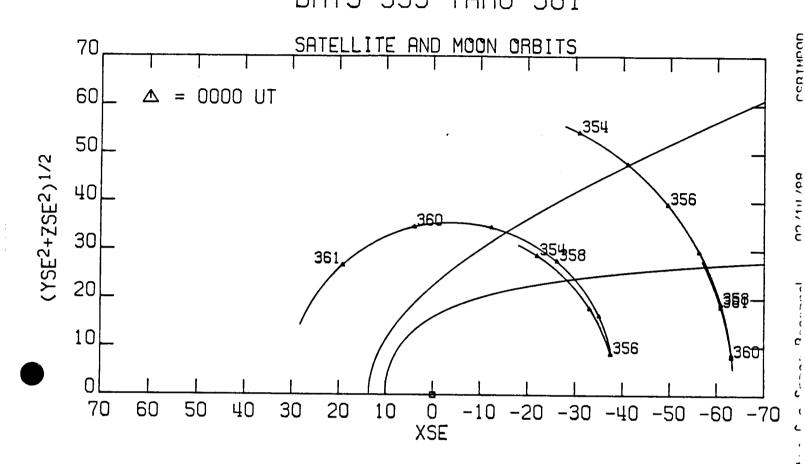


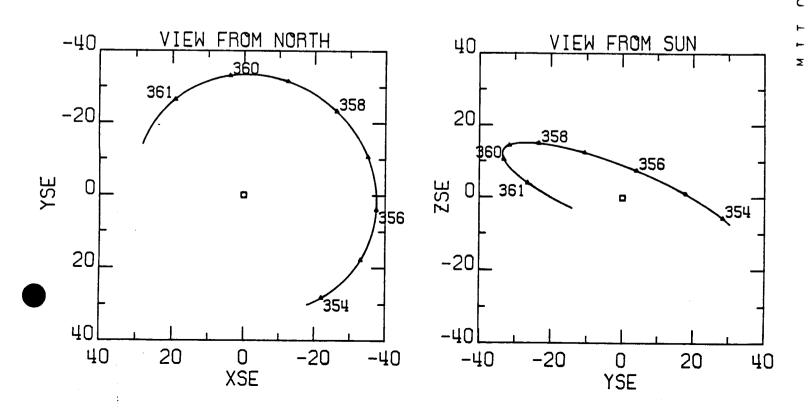


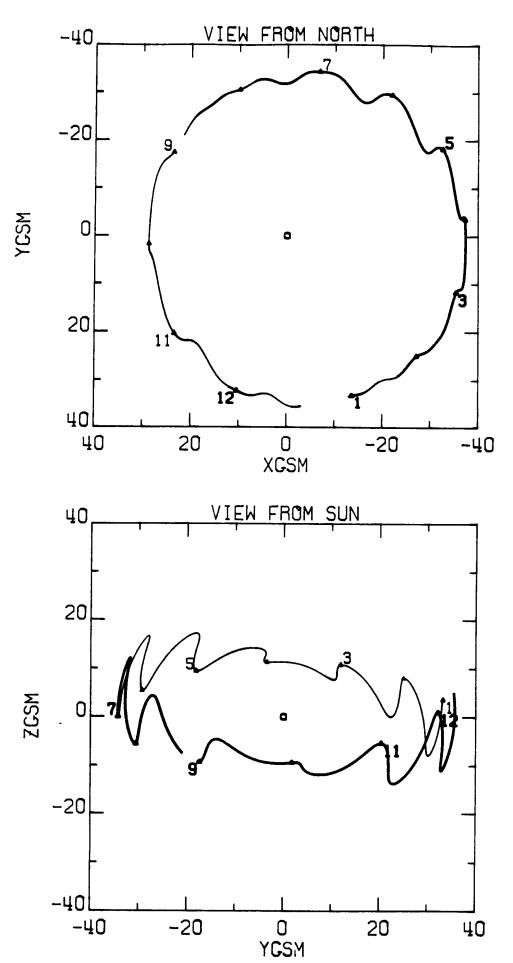
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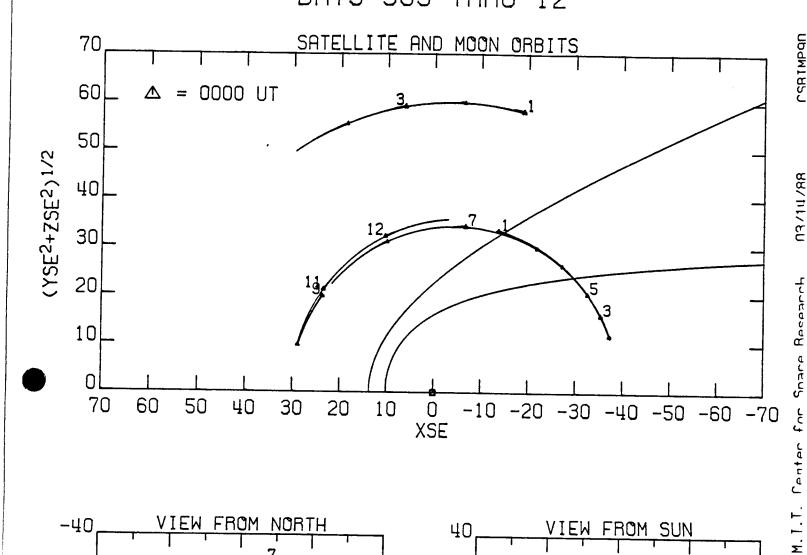
IMP 7 TRAJECTORY. ASCENDING NODE 158
FROM DEC 19 TO DEC 31 1977
DAYS 353 THRU 361

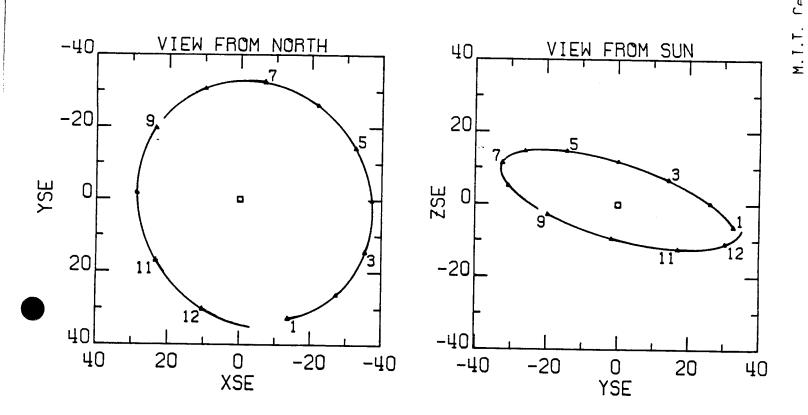


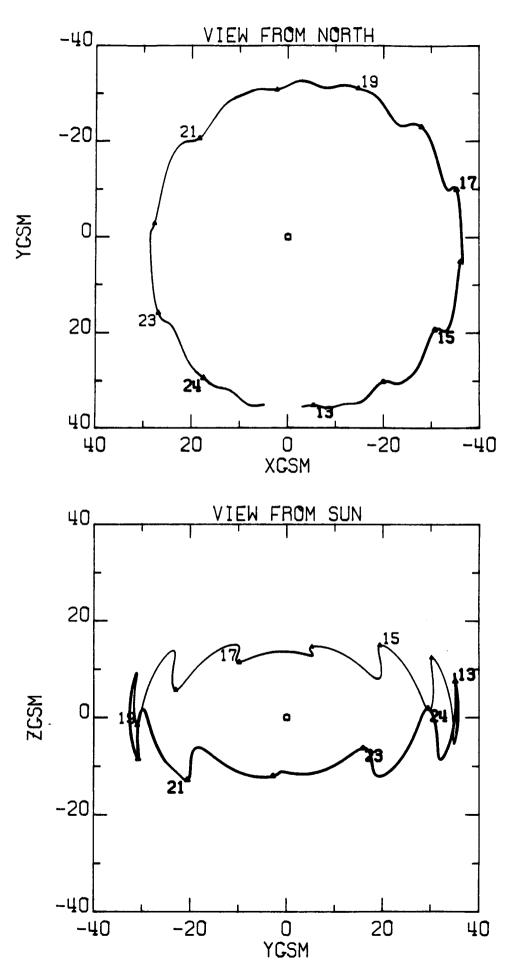




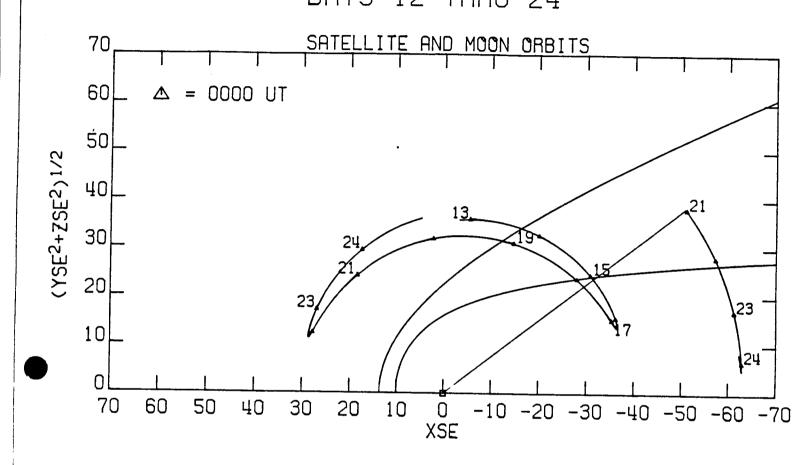
IMP 7 TRAJECTORY. ASCENDING NODE 159
FROM DEC 31 TO JAN 12 1978
DAYS 365 THRU 12

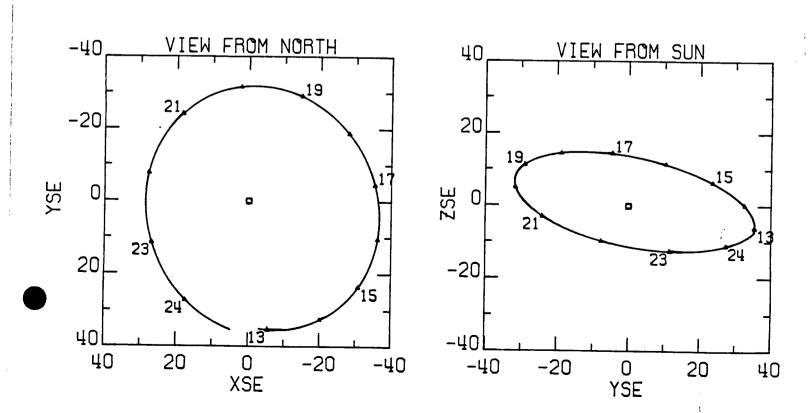


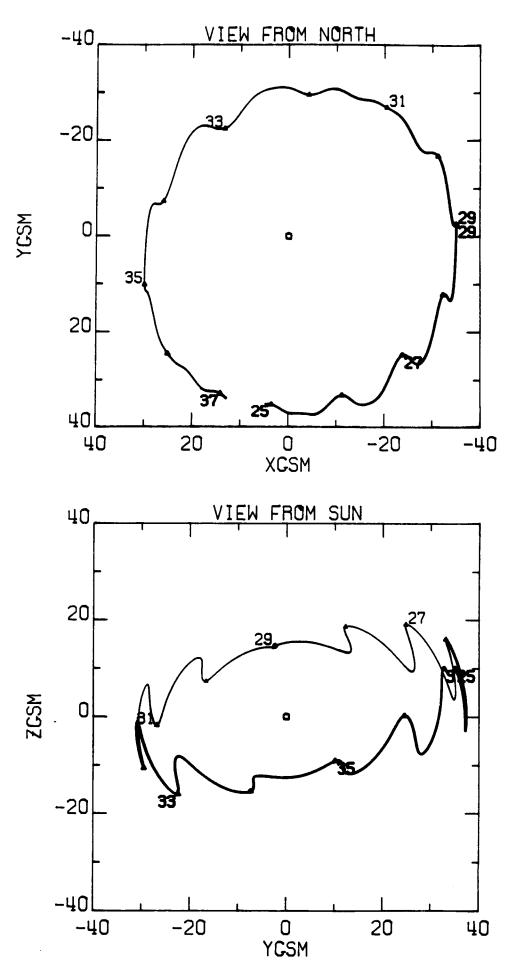




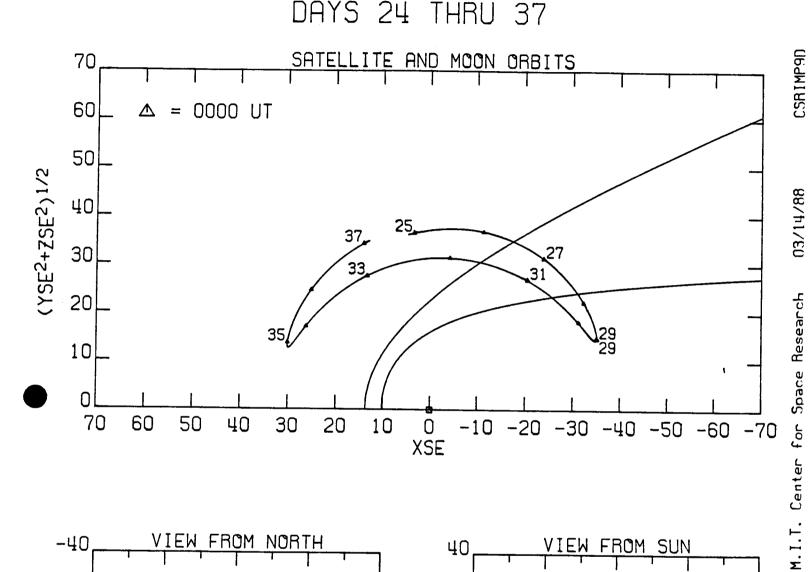
IMP 7 TRAJECTORY. ASCENDING NODE 160
FROM JAN 12 TO JAN 24 1978
DAYS 12 THRU 24

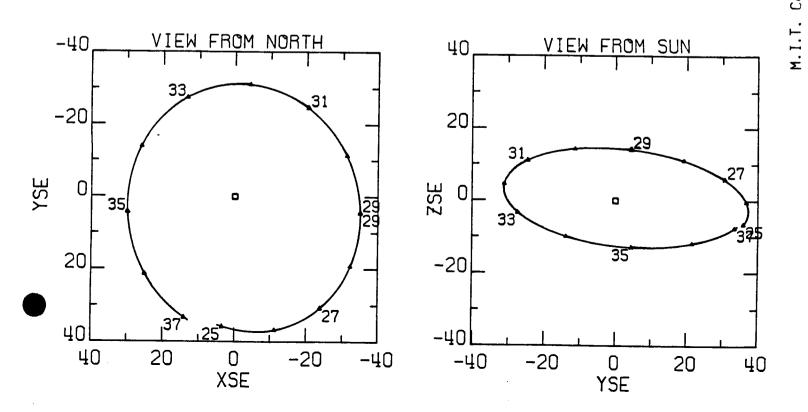


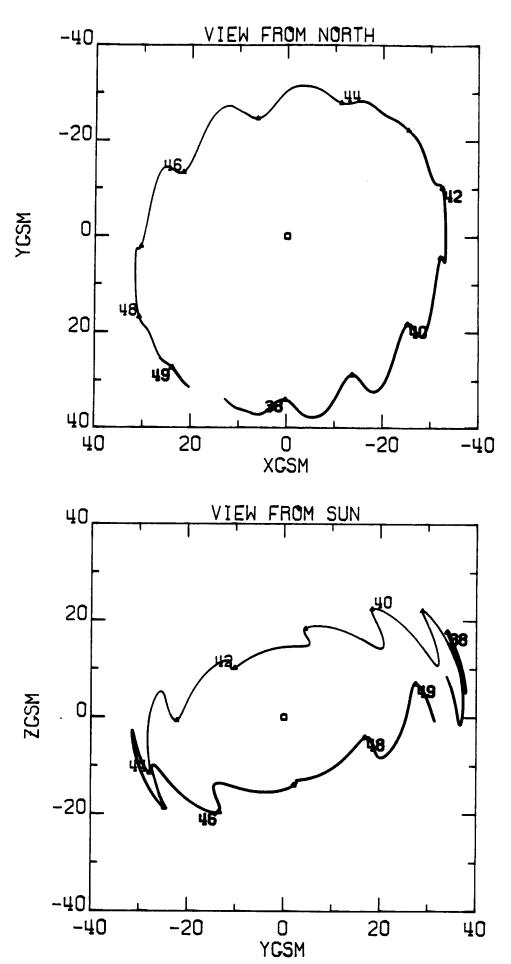




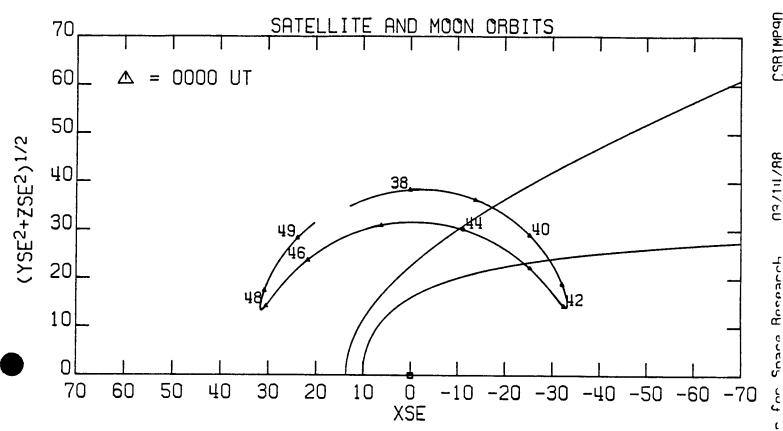
IMP 7 TRAJECTORY. ASCENDING NODE 161
FROM JAN 24 TO FEB 6 1978
DAYS 24 THRU 37

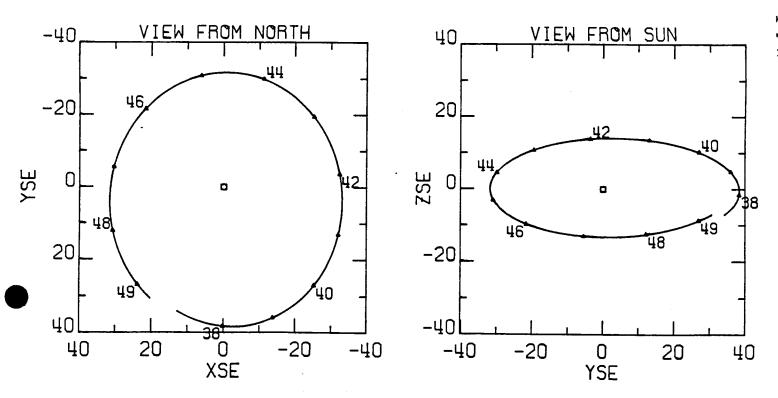




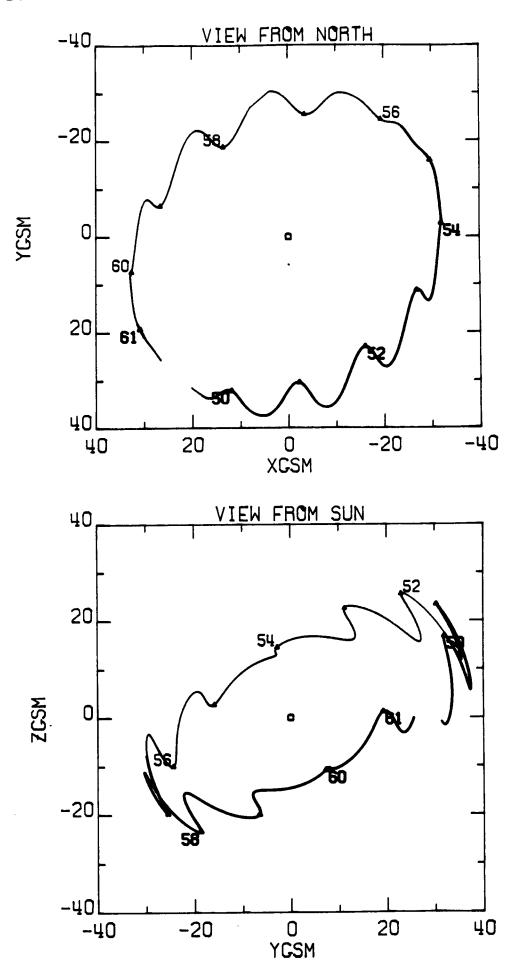


IMP 7 TRAJECTORY. ASCENDING NODE 162 FROM FEB 6 TO FEB 18 1978 DAYS 37 THRU 49

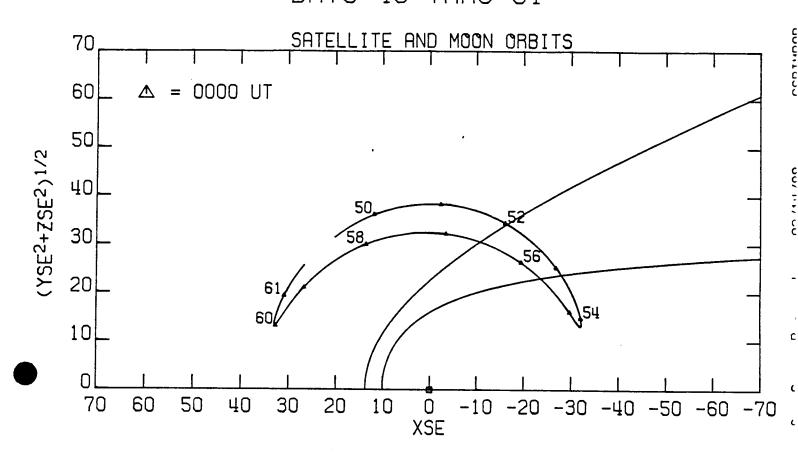


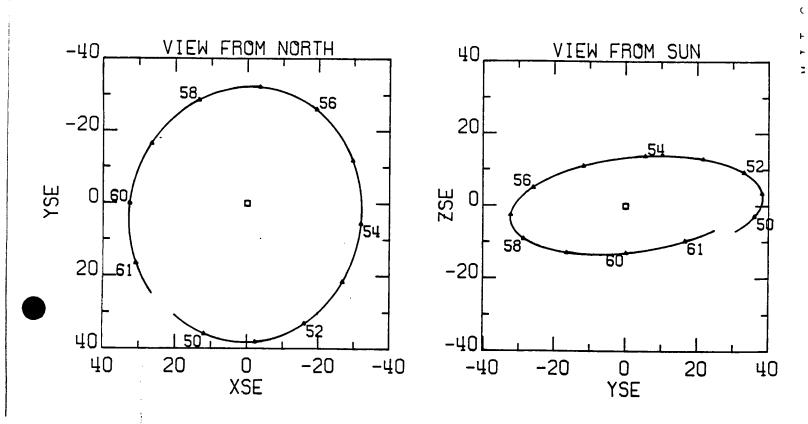


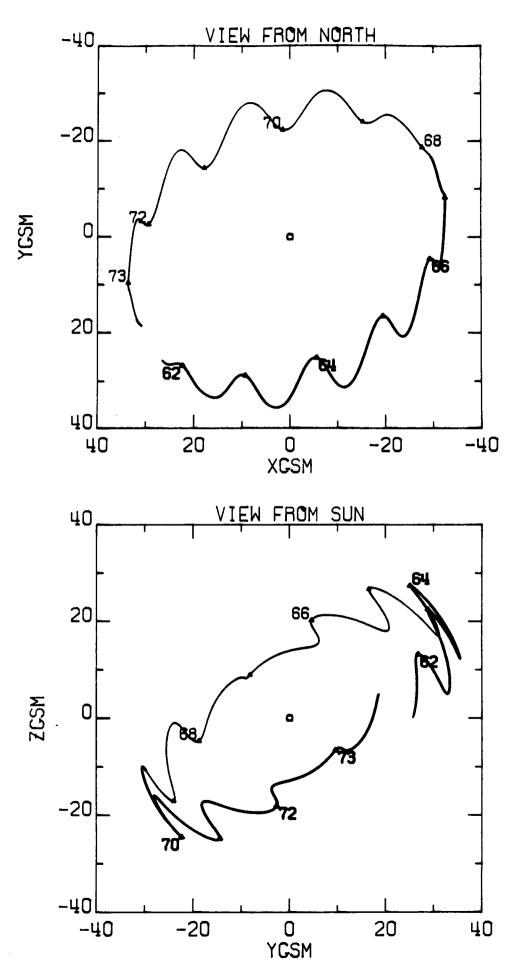
Printer for Snare Rosearch



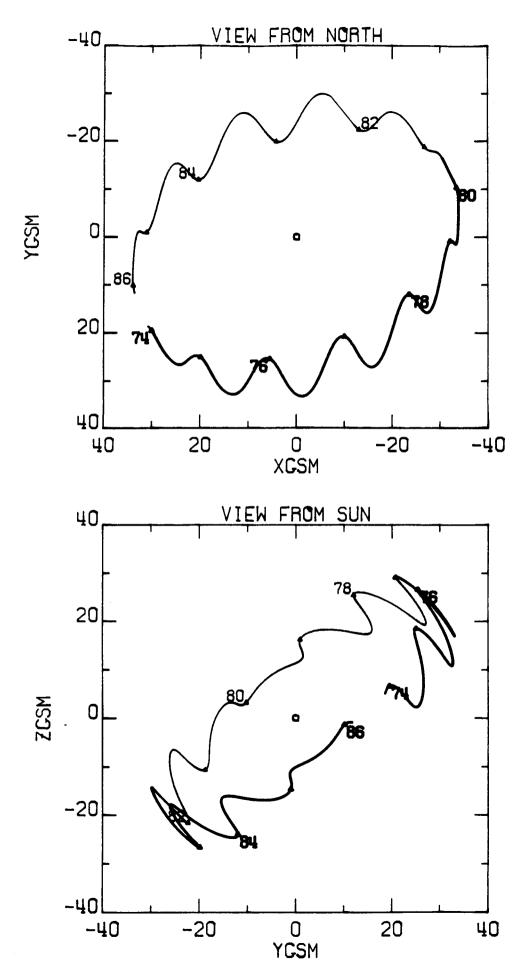
IMP 7 TRAJECTORY. ASCENDING NODE 163
FROM FEB 18 TO MAR 2 1978
DAYS 49 THRU 61



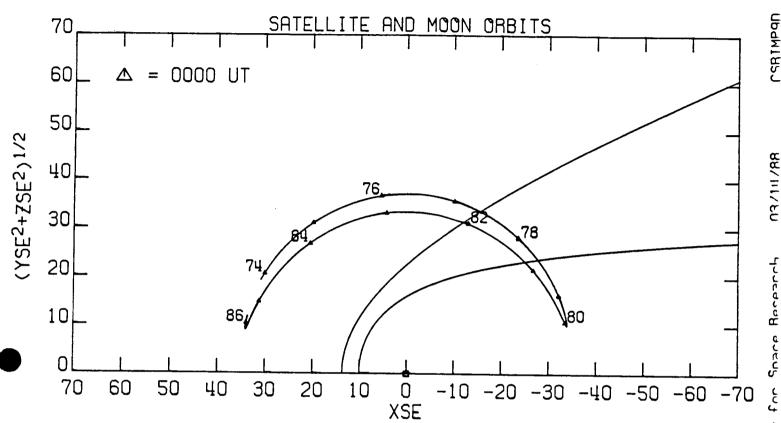


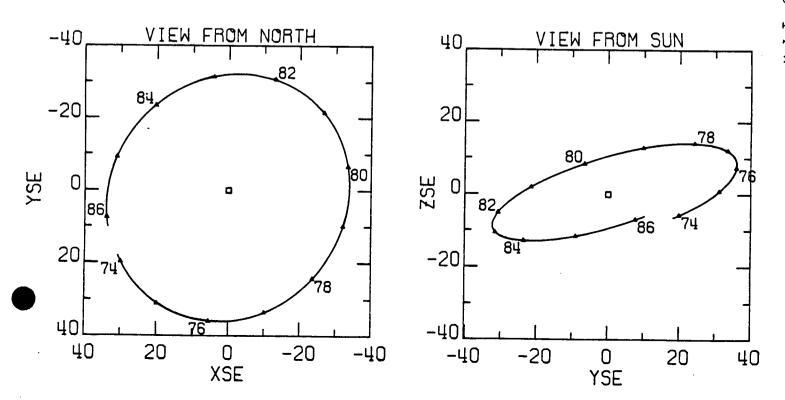


IMP 7 TRAJECTORY. ASCENDING NODE 164 TO MAR FROM MAR 2 14 1978 DAYS 61 THRU 73 **CSRIMP9** SATELLITE AND MOON ORBITS 70 = 0000 UT 60 50 (YSE<sup>2</sup>+ZSE<sup>2</sup>)<sup>1/2</sup> 03/14/88 40 64 70 30 62 M.I.T. Center for Space Besearch 20 **68**6 73/ 10 70 60 50 30 10 Ö XSE 40 20 -30 -20 -10 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN 40 -20 20 68 66 72 68 YSE **ZSE** 0 0 0 <del>7</del>3 700 62 72 66 20 -20 40 -40 40 20 0 XSE -20 -40 O YSE -40 -20 20 40

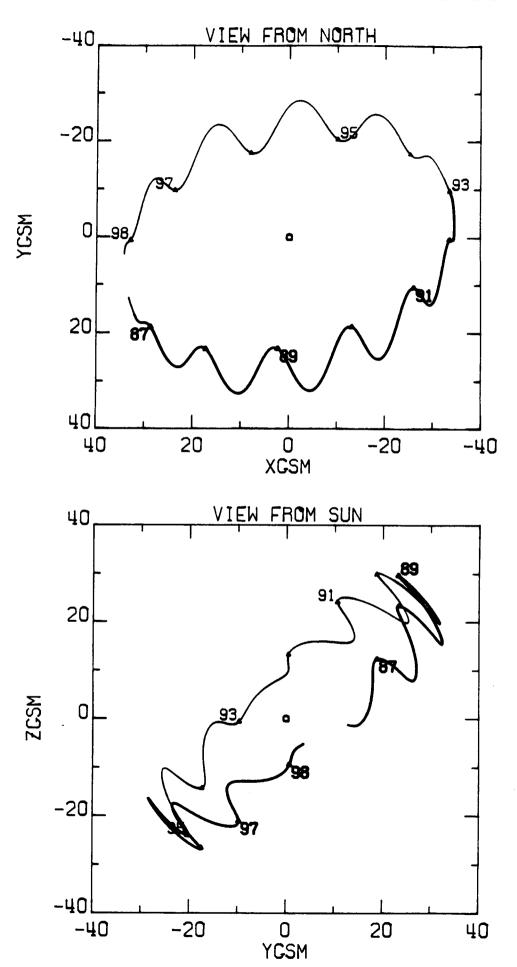


IMP 7 TRAJECTORY. ASCENDING NODE 165 FROM MAR 14 TO MAR 27 1978 DAYS 73 THRU 86

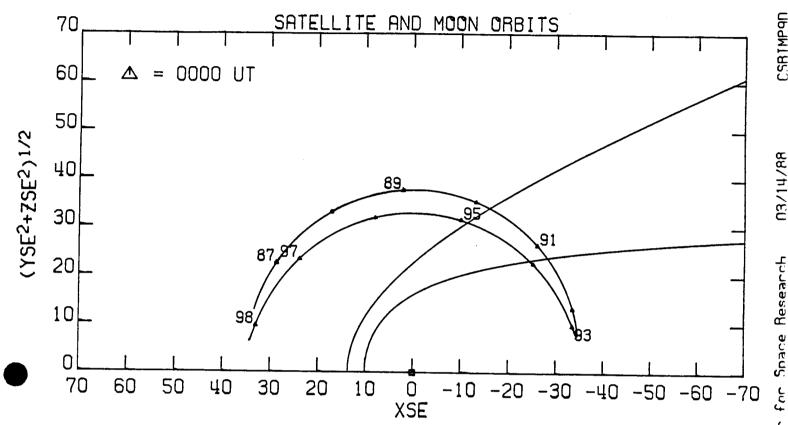


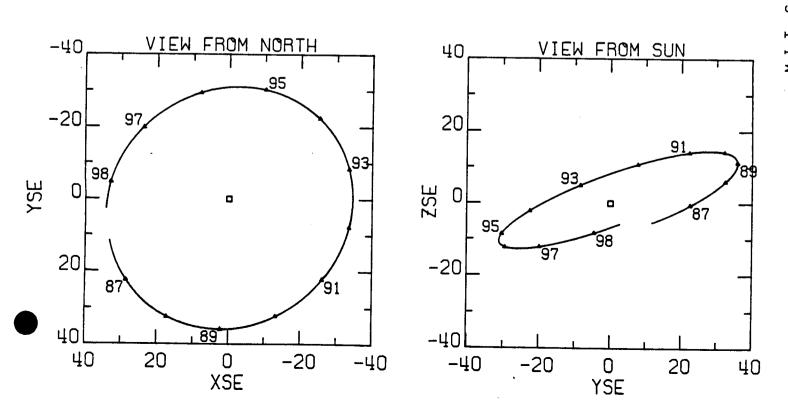


M. I.T. Fonton for Snare Research



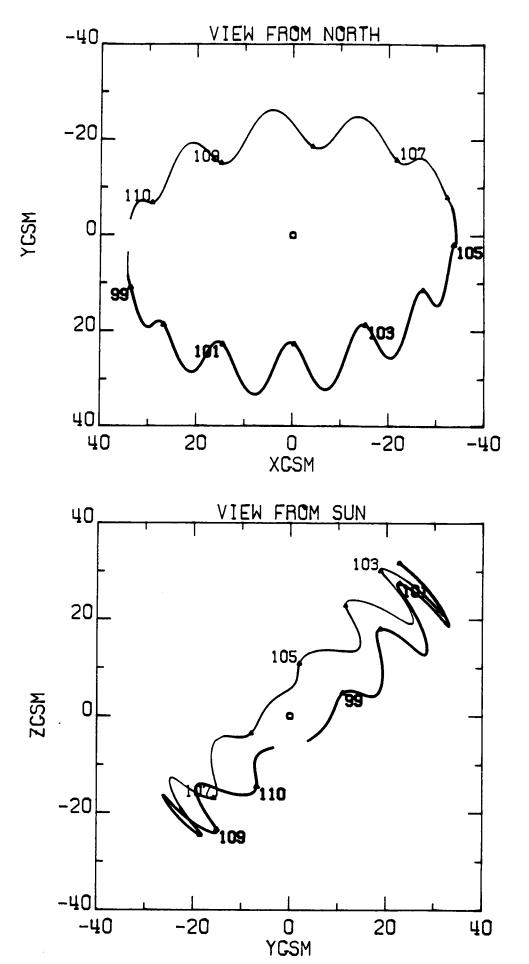
7 TRAJECTORY. ASCENDING NODE IMP 166 FROM MAR 27 TO APR 1978 8 DAYS 86 THRU 98



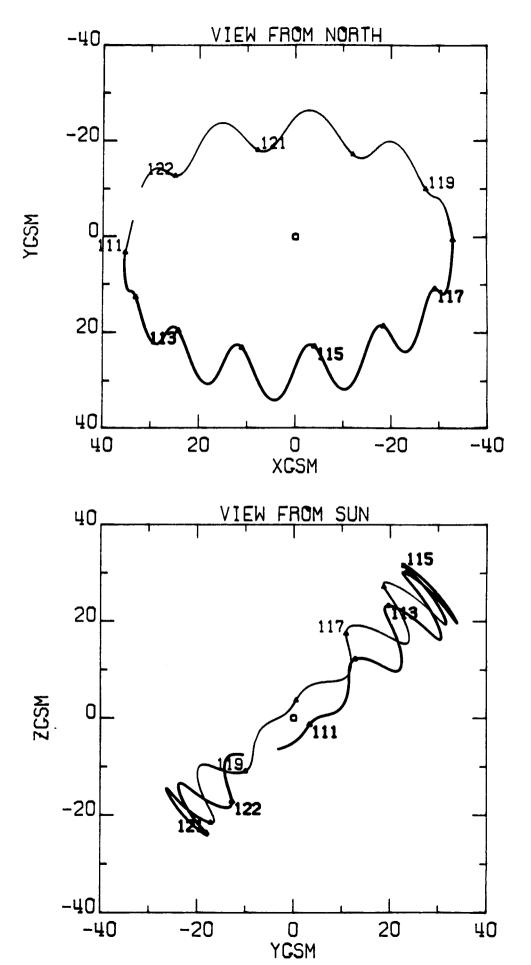


**N3/14/RR** M.I.T. Center for Space Research

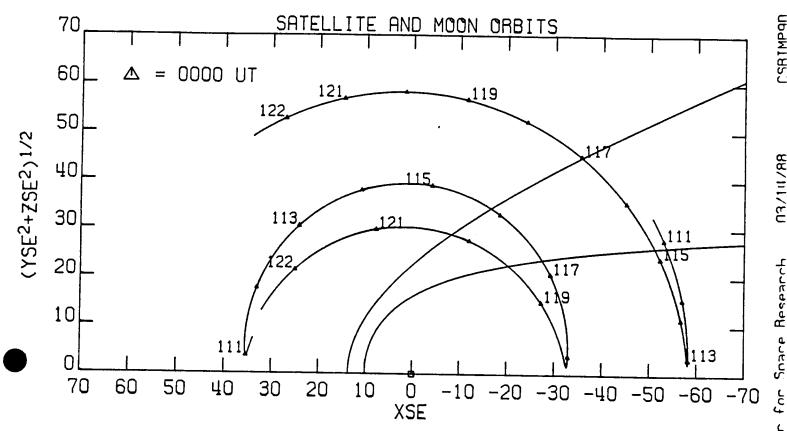
IMP 7 FROM APR 8 TO APR 20 1978

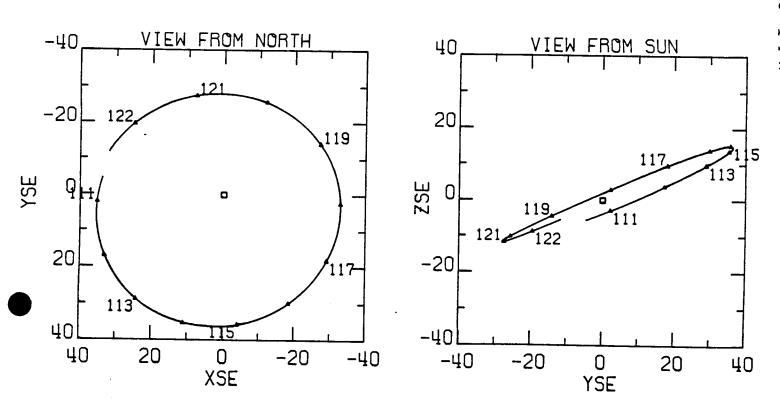


7 TRAJECTORY. ASCENDING NODE 167 TO APR 20 FROM APR 8 DAYS 98 THRU SATELLITE AND MOON ORBITS = 0000 UT (YSE<sup>2</sup>+ZSE<sup>2</sup>)1/2 for Snace Rosearch XSE -10 -20 -30 -40 -50 -60 VIEW FROM NORTH -40 VIEW FROM SUN -20 110, i oh YSE ZSE -20 XSE -20 -40 -40 -20 YSE 



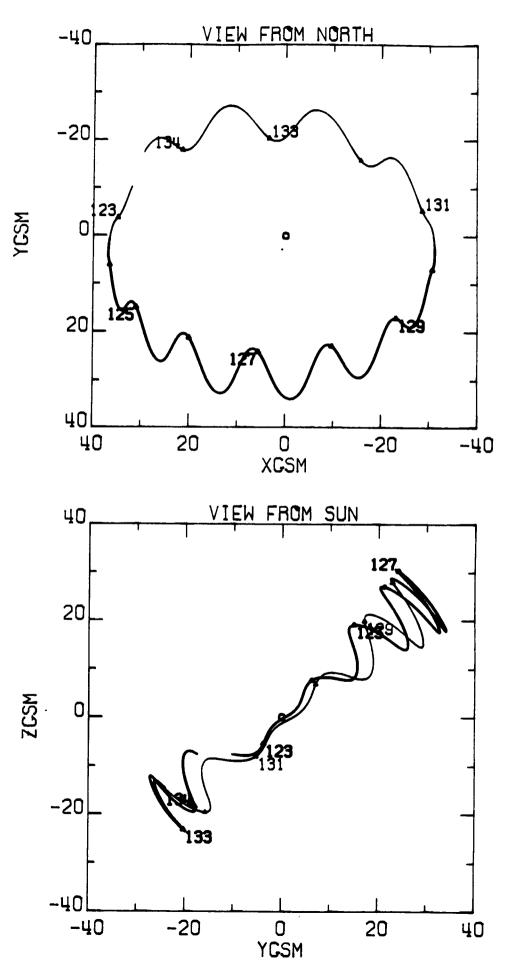
IMP 7 TRAJECTORY. ASCENDING NODE 168 FROM APR 20 TO MAY 2 1978 DAYS 110 THRU



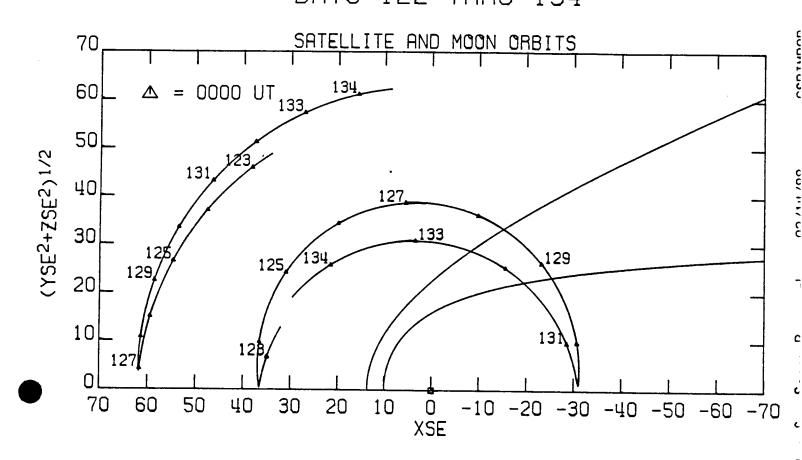


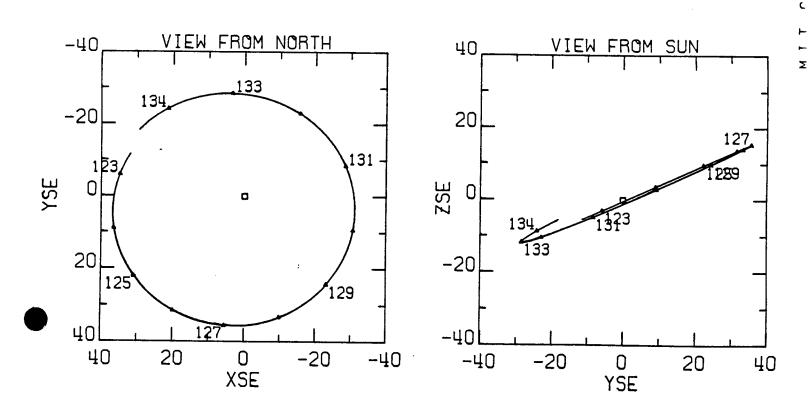
M.I.T. Center for Snare Research

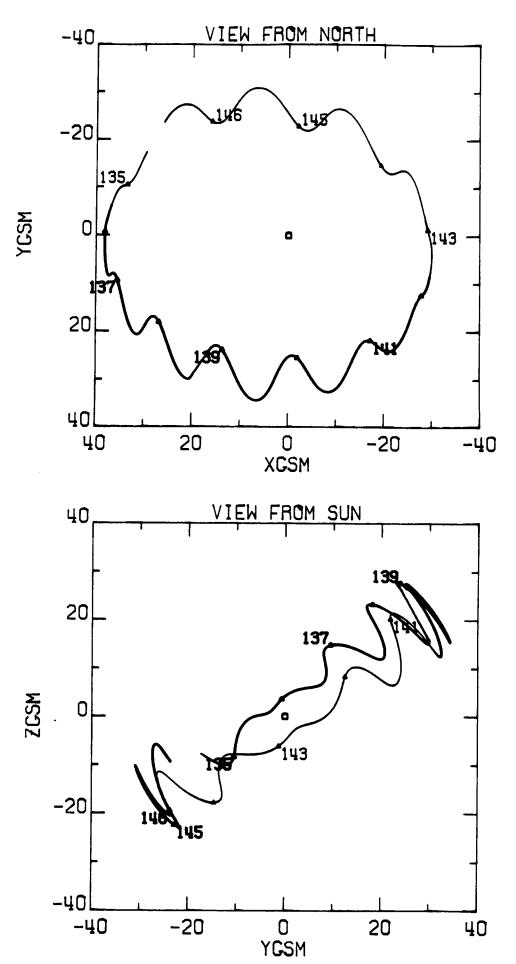
IMP 7 FROM MAY 2 TO MAY 14 1978



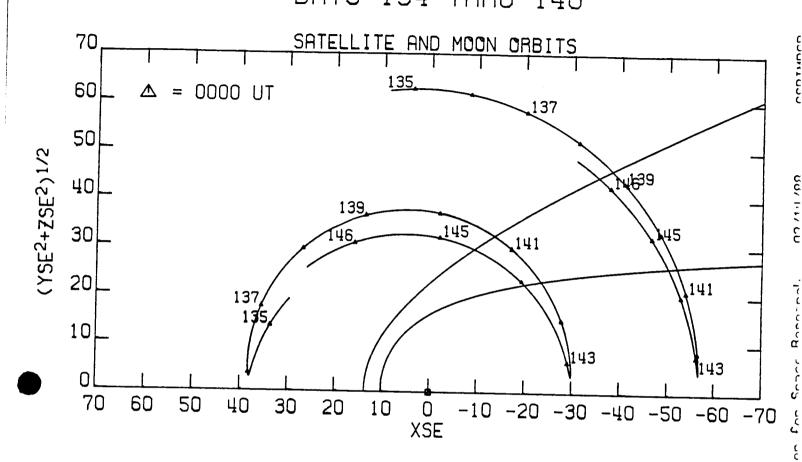
IMP 7 TRAJECTORY. ASCENDING NODE 169
FROM MAY 2 TO MAY 14 1978
DAYS 122 THRU 134

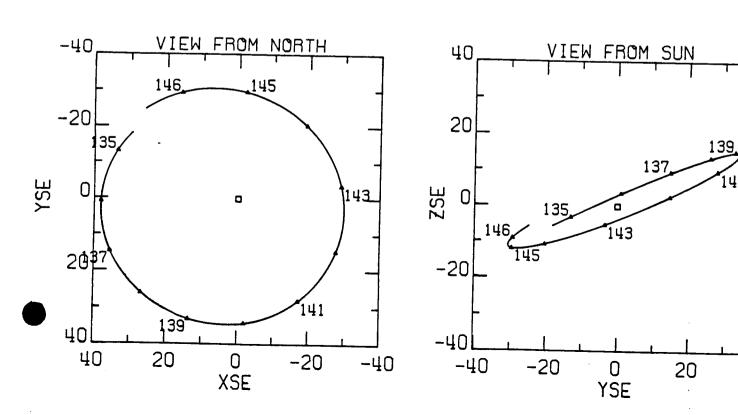






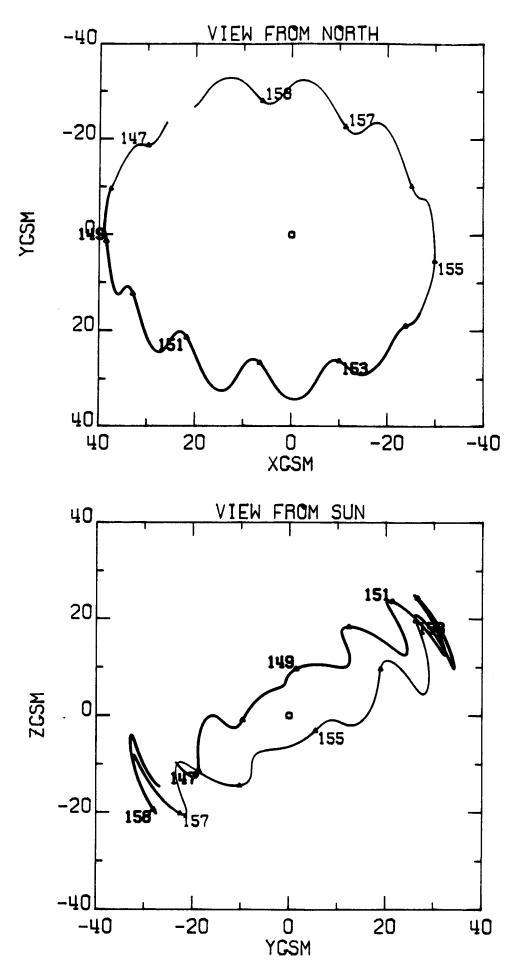
IMP 7 TRAJECTORY. ASCENDING NODE 170 FROM MAY 14 TO MAY 26 1978 DAYS 134 THRU 146



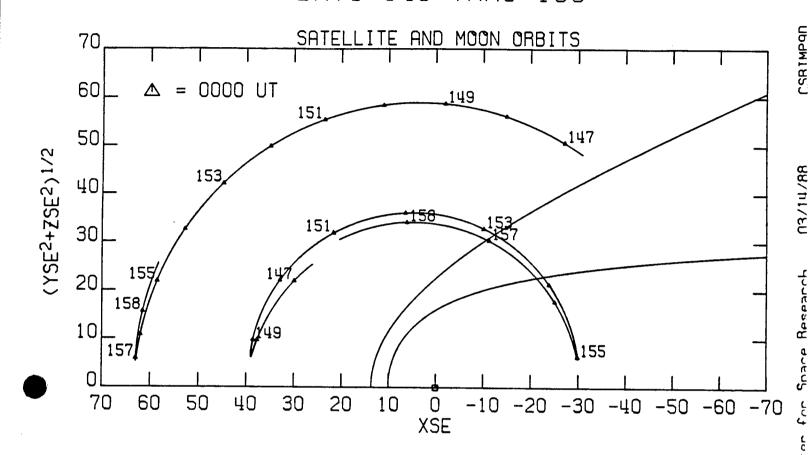


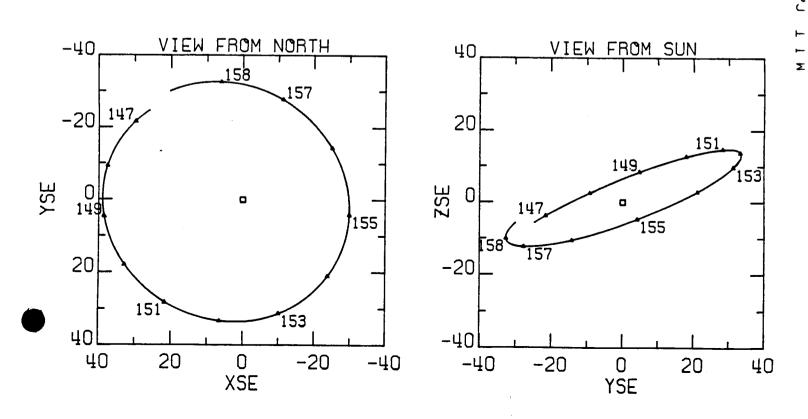
141

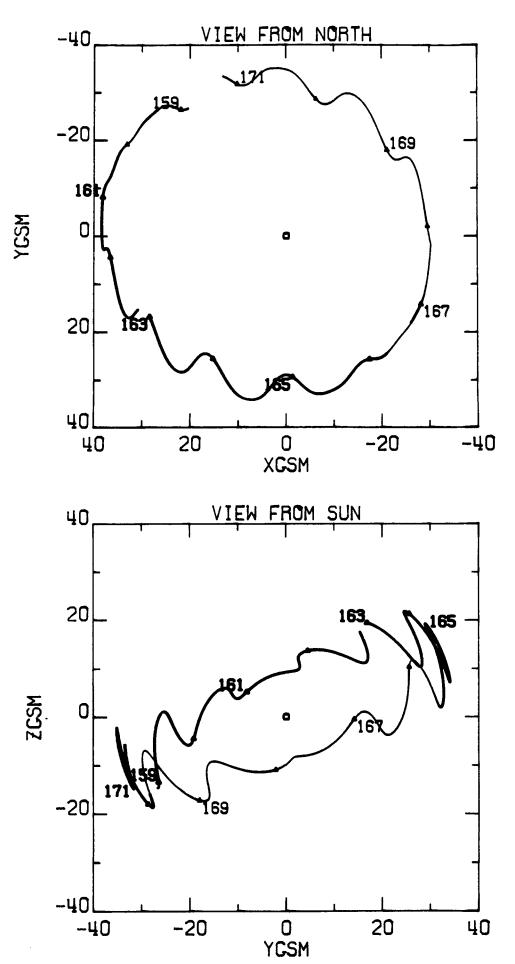
40



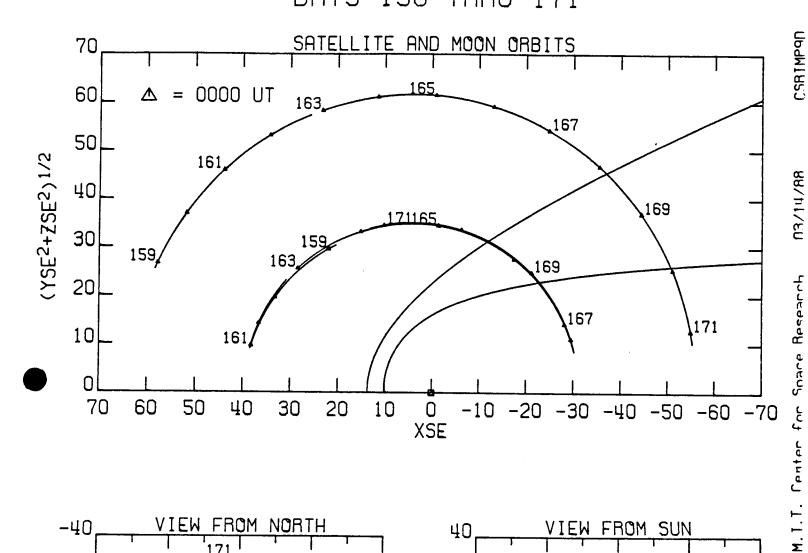
IMP 7 TRAJECTORY. ASCENDING NODE 171
FROM MAY 26 TO JUN 7 1978
DAYS 146 THRU 158

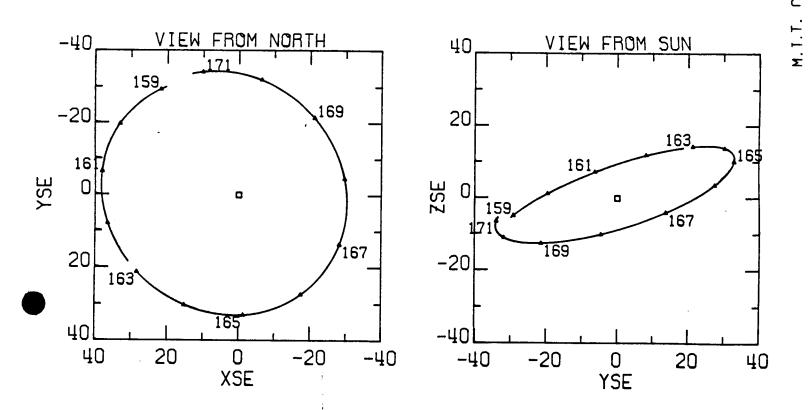


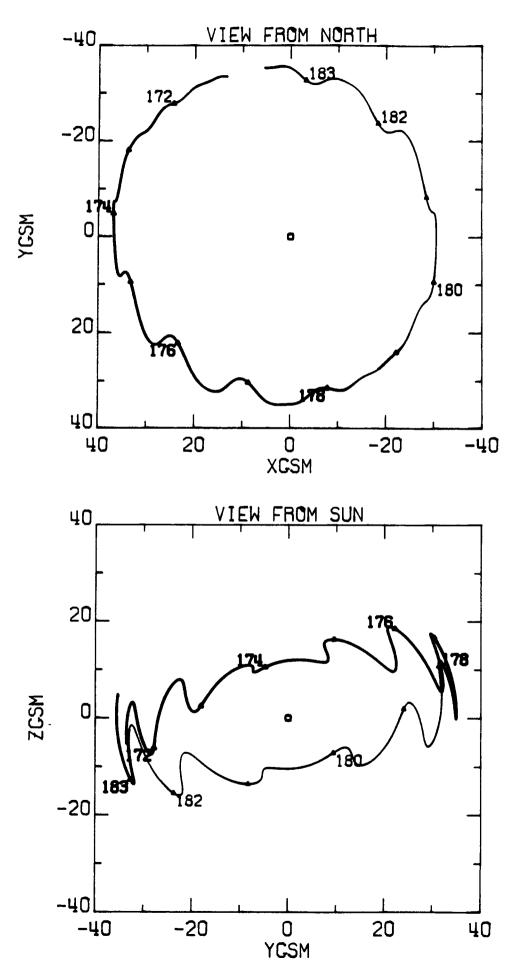




IMP 7 TRAJECTORY. ASCENDING NODE 172
FROM JUN 7 TO JUN 20 1978
DAYS 158 THRU 171







IMP 7 TRAJECTORY. ASCENDING NODE 173

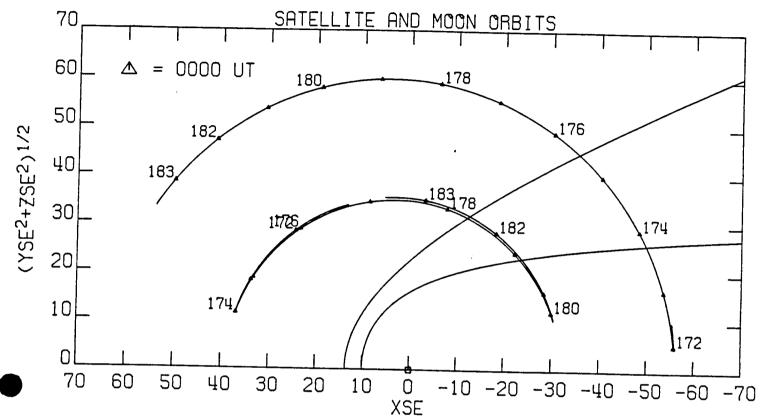
FROM JUN 20 TO JUL 2 1978

DAYS 171 THRU 183

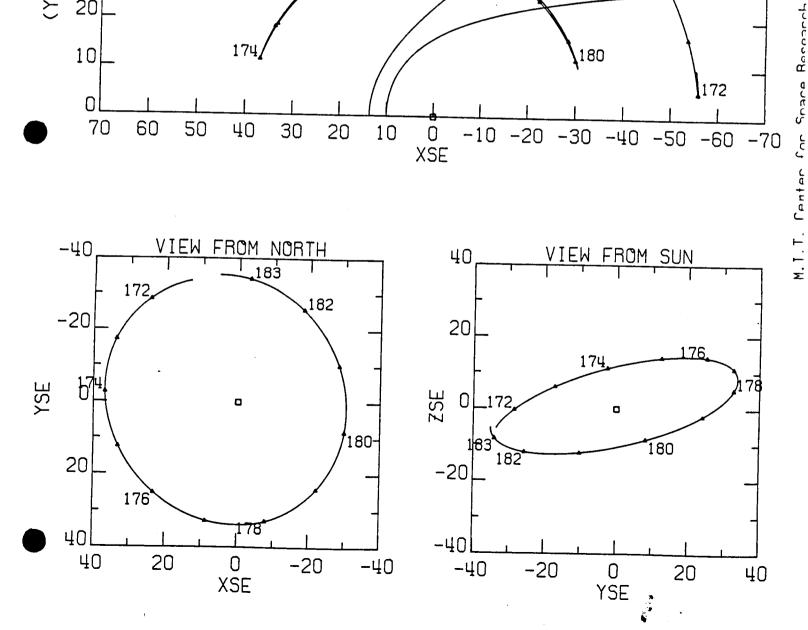
SATELLITE AND MOON ORBITS

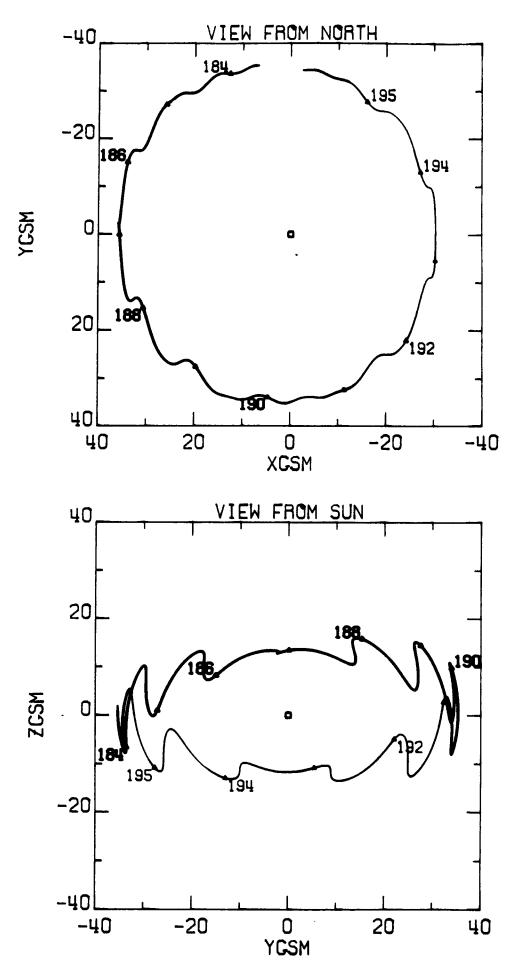
50 \( \Delta = 0000 UT \)

178

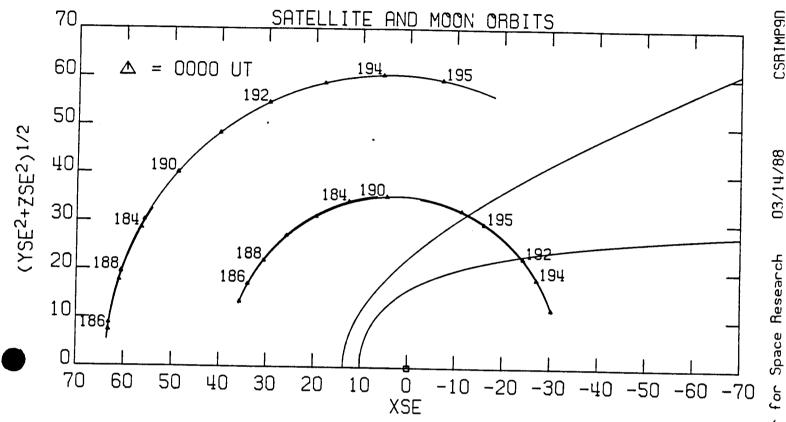


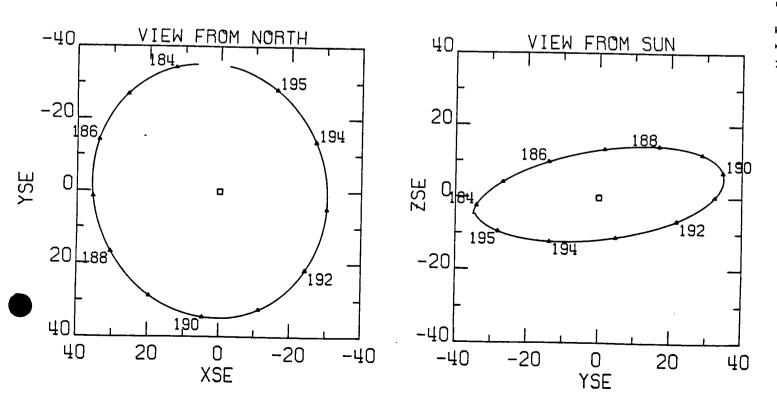
N3/111/8N



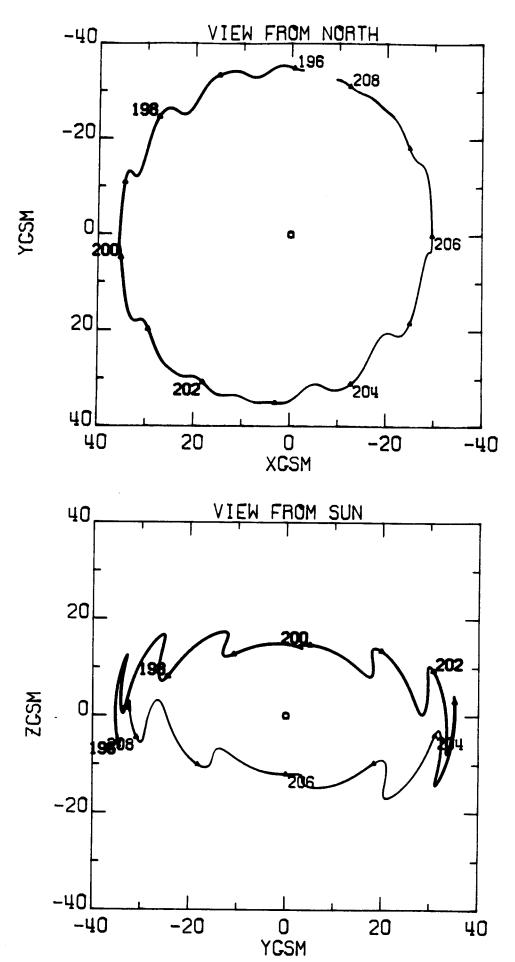


IMP 7 TRAJECTORY. ASCENDING NODE 174 FROM JUL 2 TO JUL 14 1978 DAYS 183 THRU





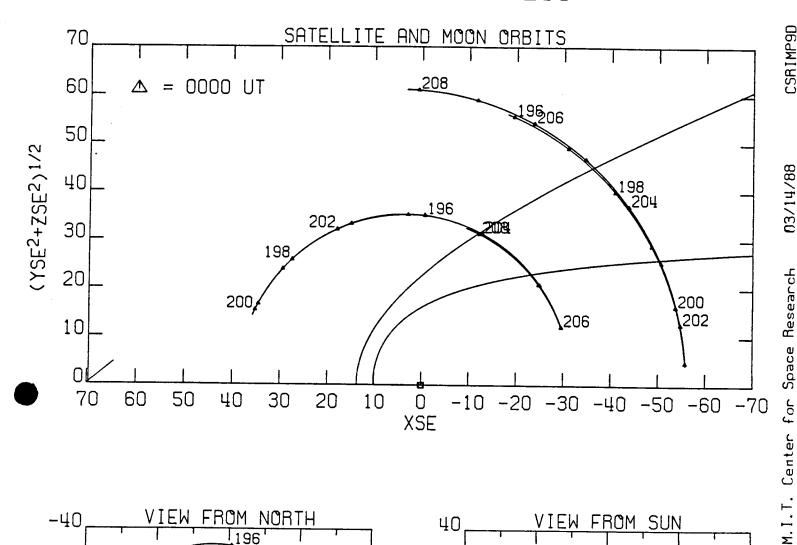
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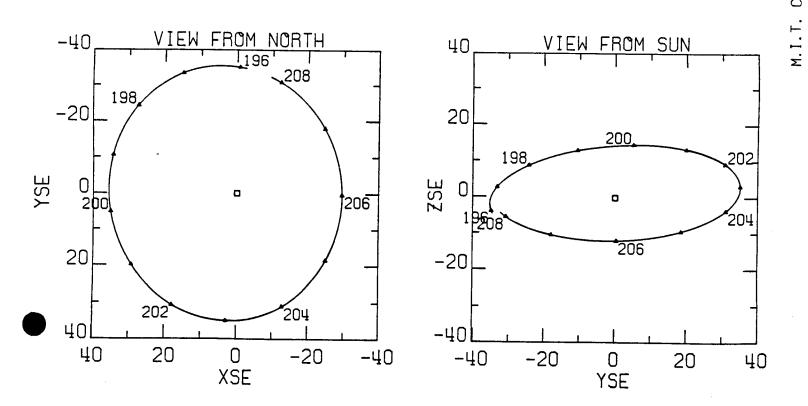


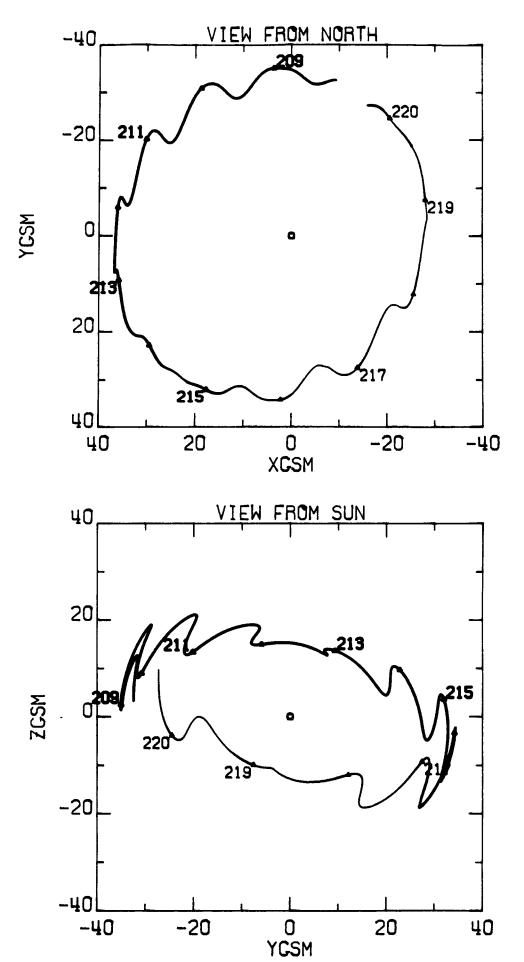
IMP 7 TRAJECTORY. ASCENDING NODE 175

FROM JUL 14 TO JUL 27 1978

DAYS 195 THRU 208

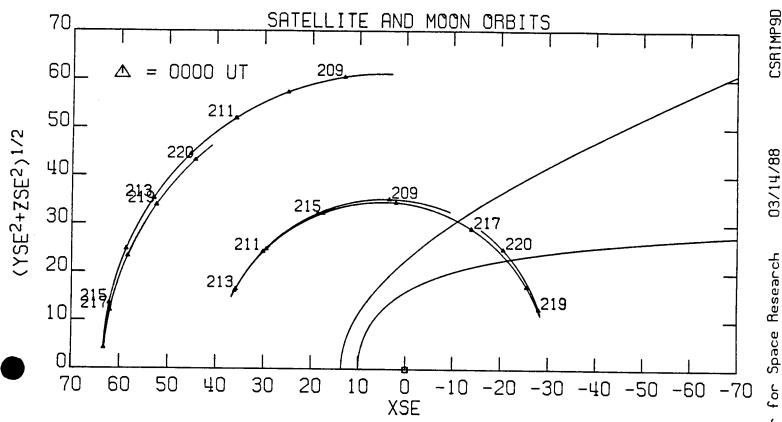


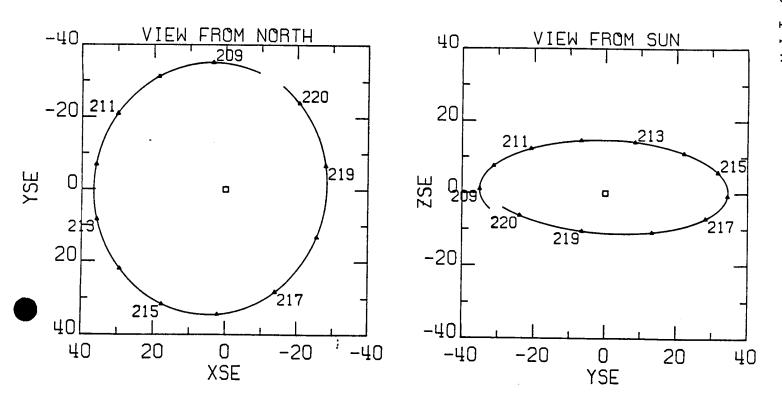




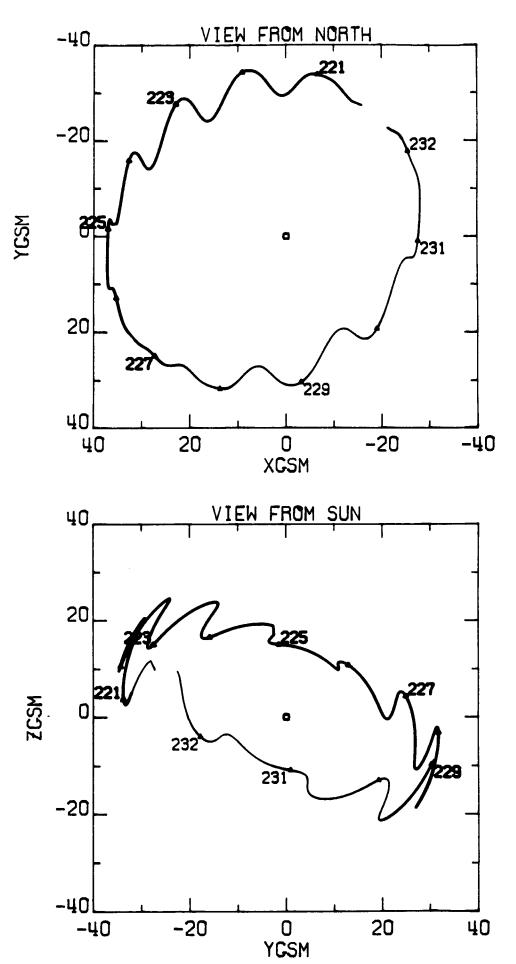
IMP 7 TRAJECTORY... ASCENDING NODE 176

> FROM JUL 27 TO AUG 8 1978 DAYS 208 THRU

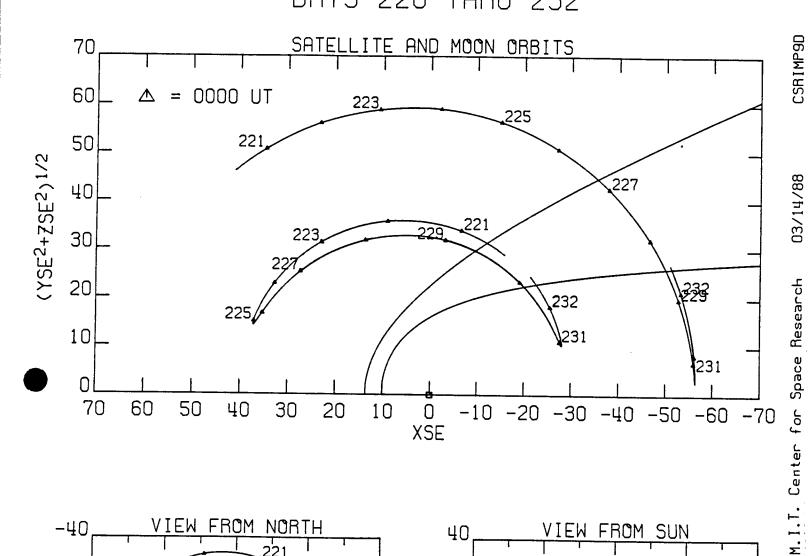


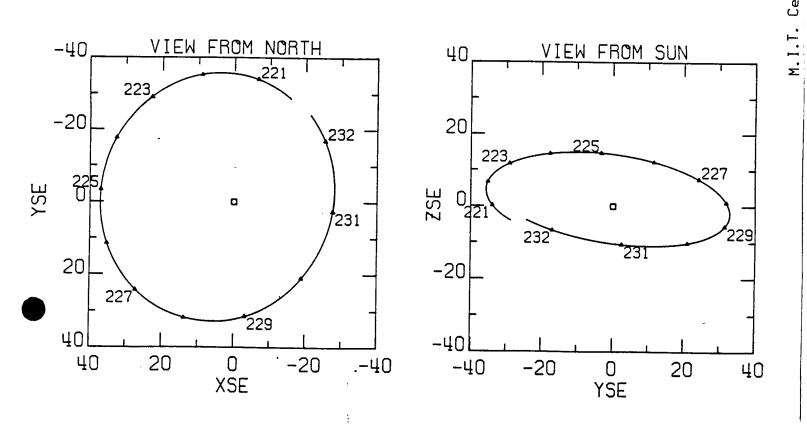


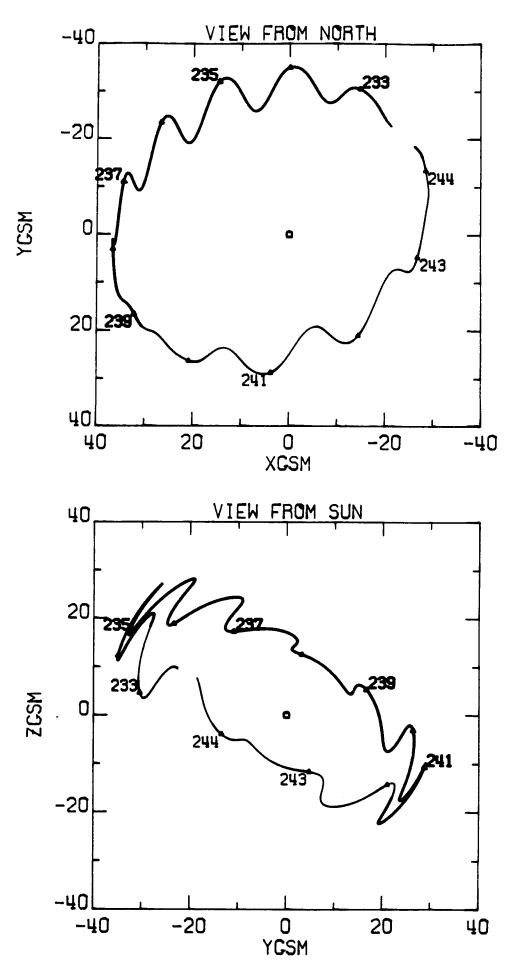
03/14/88 M.I.T. Center for Space Research



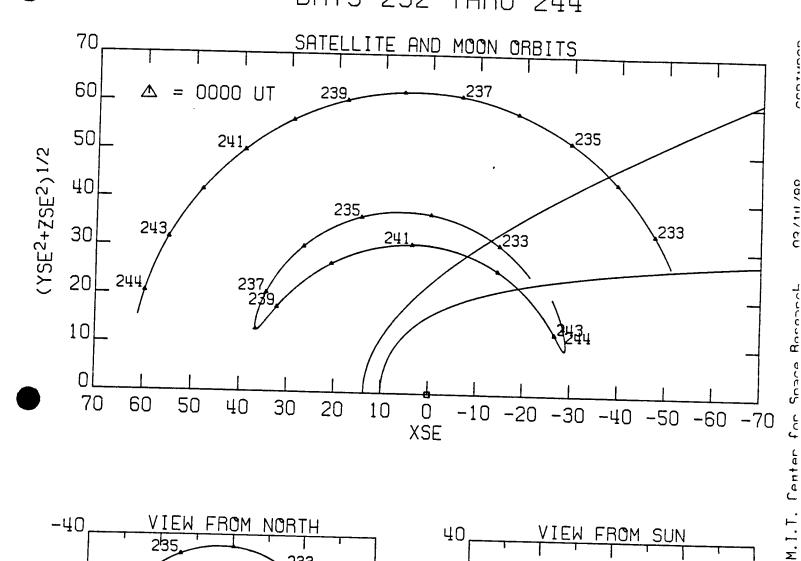
IMP 7 TRAJECTORY. ASCENDING NODE 177
FROM AUG 8 TO AUG 20 1978
DAYS 220 THRU 232

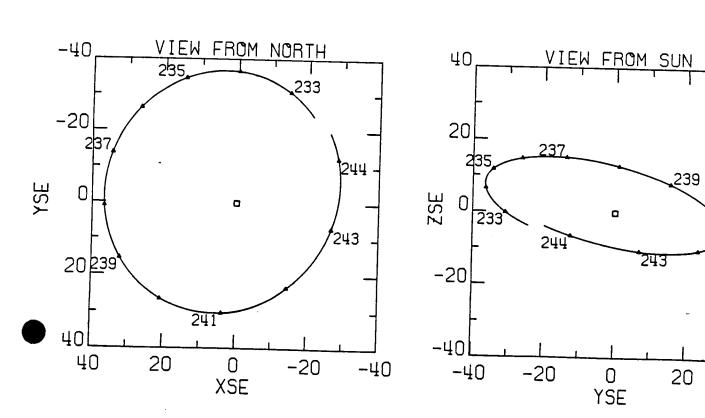


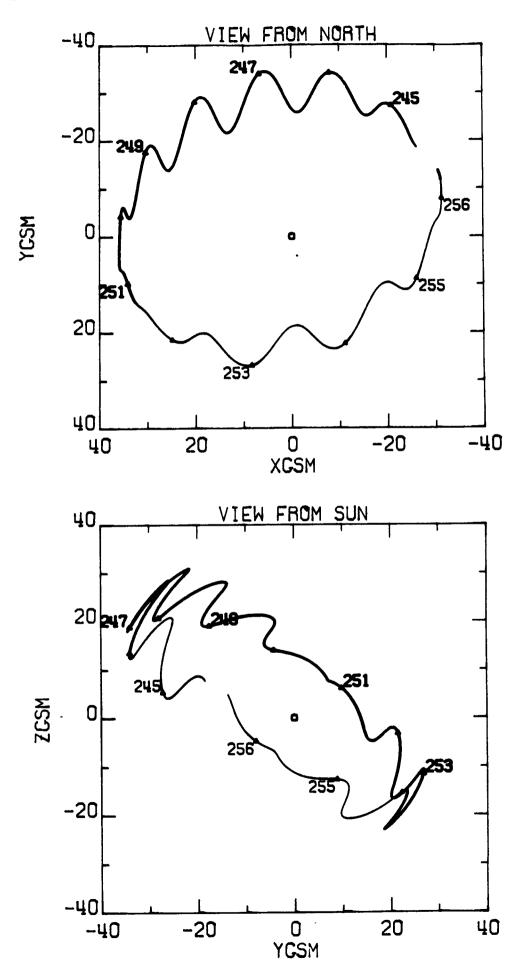




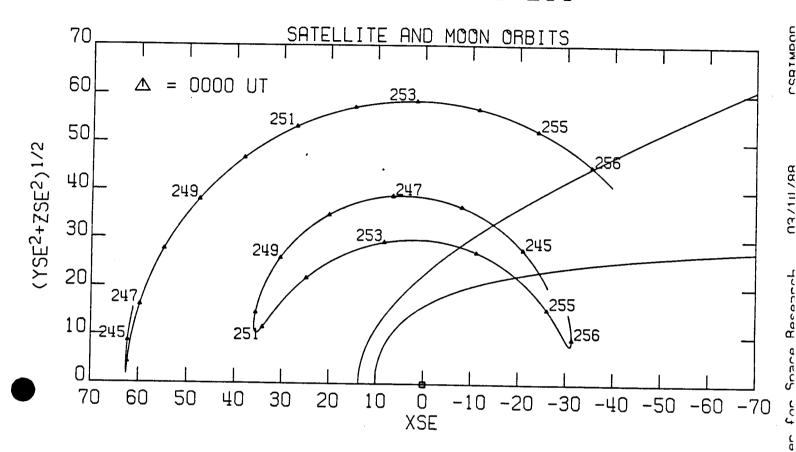
IMP 7 TRAJECTORY. ASCENDING NODE 178
FROM AUG 20 TO SEP 1 1978
DAYS 232 THRU 244

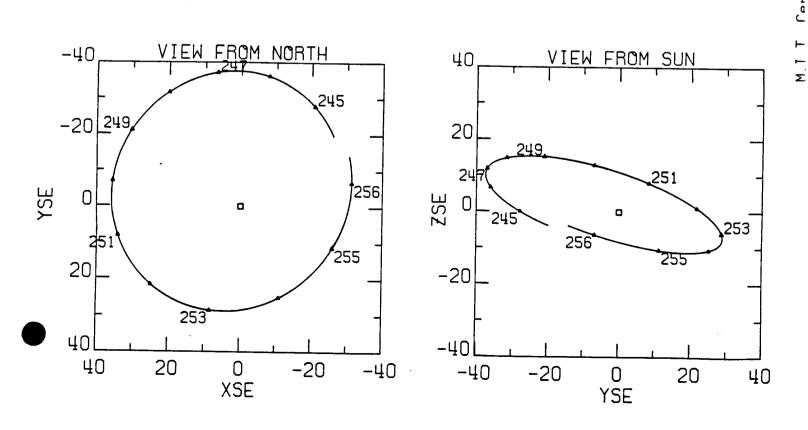


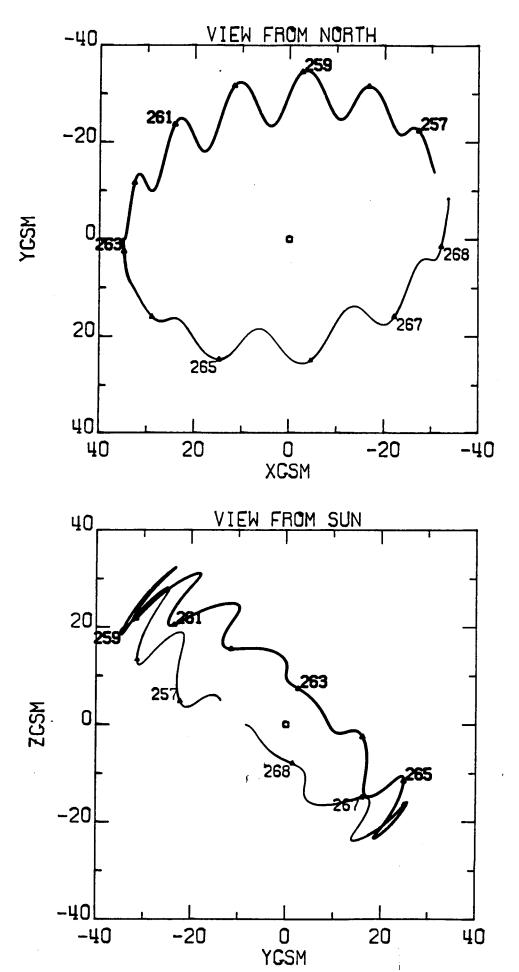




IMP 7 TRAJECTORY. ASCENDING NODE 179
FROM SEP 1 TO SEP 13 1978
DAYS 244 THRU 256







IMP 7 TRAJECTORY. ASCENDING NODE 180

FROM SEP 13 TO SEP 25 1978
DAYS 256 THRU 268

